# amateur radio


VOL. 44, No. 12 DECEMBER 1976

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**COVER PHOTO**

*EMDRC junior member Frank Walsh operating portable station set up in the foyer of the Nunawading Library. See article on page 8.*

*(Photograph by Bill Rose)*

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

# HAM RADIO SUPPLIERS

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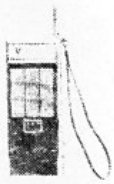

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# amateur radio

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# QSP LET'S LOOK AT THE YEAR

**In 1976**

**The WIA was invited to join the Australian Planning Group for WARC 79 and has been represented at all meetings held so far.**

**The IARU held the first ever inter-regional conference in its history. Much forward planning was done at this conference on the Amateur Services stance for WARC 79.**

**This conference, being well aware of the problems of the small society, or country with no society at all, initiated the preparation of material for our "Amateur Radio World Wide Position Paper" for their assistance.**

**The WIA appointed a Federal Education Co-ordinator as it was felt there was a distinct need to widen our horizon in this area.**

**The WIA made numerous suggestions to the authorities with regard to examinations, and at present the Education Co-ordinator is discussing these with the examination section of the RFMB.**

**The reaction to the Arnold Report gave the impression that most divisions are satisfied with the present organisational system. However during my trip to Queensland which extended as far as Townsville it was apparent that the members who live well away from their divisional H.Q. have different requirements from those who live in the capital city.**

**Taking these matters and many others mentioned throughout the year in WIANEWS it is easy to see that 1977 will be another very busy year for the executive, with many very critical matters under negotiation.**

**I would like to take this opportunity of wishing you all the Season's Greetings on behalf of the executive and Executive Office.**

**DAVID WARDLAW** ■

# EDITOR'S DESK

*Bill Roper, VK3ARZ*

**This being the final issue for 1976 the Editors and members of the Publications Committee wish to take this opportunity to wish you all a Very Merry Christmas and Prosperous New Year.**

**Because of holiday closures in the printing works, January AR will be delivered immediately before Christmas and should be in the mail before the New Year. The closures also affect February AR which should go out early in the second week of February.**

# QSP

**11th AUSTRALIAN SCOUT JAMBOREE**

The 11th Australian Scout Jamboree will take place at Rossmoyne Park, Dandenong from Dec. 29th to Jan. 7th. VK3BSA, the official station of the Jamboree will be operating 24 hours a day for the duration of the Jamboree.

Primary frequencies will be 3.590, 7.090, 14.290, 21.360 and 28.990 MHz.

**PUBLICITY**

"Very early after taking office, I learned that many members expect their Director to solve all of 'their' problems. An example of this is the problem of bad publictiy sometimes received from Citizens Band trouble that appears in the press under the name of "ham radio". We all decry such bad publicity and want to do something about it. The League has written hundreds of letters to newspapers about the country telling them the difference between CB and Amateur Radio. Directors write letters. Club and other amateur groups do the same but with seemingly little effect . . . somehow many newsmen cannot seem to get the difference between CB and Amateur Radio in mind, at least over a long period of time". "Doc" Gmelin, W6ZRT, the ARRL Pacific Division Director writing in Worldradio News, July 1976. He went on to say "sometimes, even when something is printed, it does little good if no one will read it".

**TRANSCEIVERS FOR MINES**

A report in the S. African Digest of 1-10-76 shows that special low-frequency radio transceivers have been developed for use in gold mines and are to be mass produced early in 1977. The transceivers provide underground communication with a range of about 300 Mx through solid rock, but base stations could increase this by a further 1000 Mx.

**READABILITY FIVE?**

Contributors of "Letters to the Editor" and some of the other features in AR, would make the Editor's task a little easier if material that is hand written is done so in a **legible** manner.

Material submitted for publication **should** (where possible) be type written, double spaced and on one side of the paper only. Thank you VK3UV.

**AR POSTINGS**

Very strange or perhaps not so strange in Mr. Murphy's law book. This business of getting AR out on time. No matter what care is taken all along the line something unforeseen fouls up the system more often than not. If a delay of a day or two occurs mid-month it seems reasonable that this will become magnified into four or five days by mailing time. A holiday of weekend intervenes at a critical point to cause that additional delay. On the other hand one would believe that a day or two might not matter so much near the end of the production cycle. Not so. This stretches into maybe 5 or 6 days because perhaps the mailing service had scheduled AR for a particular day but because of the delay other mailing had to be programmed instead and AR thereafter slotted in 'as and when'. The production of a monthly journal is in the hands of many people all working together to meet a deadline. Unfortunately all of these people (and companies) are also busy with other work, so if AR is late arriving from one link in the chain the delay tends to snowball by reason of throwing other schedules out of gear. Everything possible is done to keep AR production on time, especially is this important to those who live far from Melbourne and suffer the inevitable additional transit delays.

**SATELLITE SEARCH AND RESCUE**

The Telecommunications Journal Aug. '76 carries a report that the Canadian authorities have successfully demonstrated the feasibility of a new satellite-aided search and rescue concept that could reduce the time fuel and other costs associated with conventional methods of finding downed aircraft. Experiments were employed using Oscar 6 and simulated distress signals showed that a relatively low-cost, low altitude polar orbiting satellite could pinpoint crash sites in Canada and elsewhere in the world to within 8 km in as little as 15 to 20 minutes after the spacecraft first "hears" the signal put out by an ELT operating on 121.5 MHz.

**AN UNWANTED EXPORT**

It is noted in HR Report that FCC agents and US marshals arrested some dozen outlaw opera-

(Continued on page 5)

# WIANEWS

## CITIZENS BAND

*One of the main topics of discussion in recent months has been CB.*

*Already reported in WIANEWS Nov. AR the Executive listened to what a group of CBers had to say about legalisation of this service in Australia. The background information from this meeting is likely to be useful when the Government calls for comments on this question in the near future — maybe before the end of this year.*

*Meanwhile the media are enjoying themselves with CB and almost everyone is getting into the act. If the 'man in the street' reads the material served up to him he would be really naive to believe all of it.*

*There is no reason at all why amateur radio should be linked with CB. Unfortunately few journalists can resist the temptation to refer to our service, oftentimes in derogatory terms and occasionally in the most offensive manner. Many writers on the subject display their ignorance by incorrect references even to the proper licensing and controlling authority for radio frequency spectrum management.*

*It seems that we in Australia are not alone in suffering from media falsehoods and deceptions. Those who listened to the Federal tape broadcast on 3rd October will have noted the problems experienced in the U.S.A. on bad publicity appearing in the press under the guise of "ham radio". Doc Gmelin, W6ZRJ, the Pacific Director of ARRL had a lot to say about this in a recent issue of Worldradio News. He bemoaned the fact that it was almost impossible to get the true picture of amateur radio across to the media. His article went on to comment that respect is not bestowed, it is earned, and respect for Amateur Radio comes from the good things we do for the public. Often the radio amateur does not do nearly enough to get attention from the masses, he thinks; even if, by some great good fortune, something good does get into the Press it has little benefit if no-one will read it.*

*An article in a recent issue of a U.S.A. business magazine carried the news that the CB channels had been increased from 23 to 40 in an attempt to relieve the overcrowding in urban areas. Coupled with this, the article pointed out, was the tightening of equipment specifications to reduce interference to other electronic apparatus, including TV sets, and that the F.C.C. themselves would in future undertake their own testing of CB gear instead of relying on manufacturers claims.*

*The announcement by our Minister for P & T that strict standards will be laid down in Australia for CB equipment if citizens band radio is legalised appeared in the press as a warning to purchasers if dumping occurs as the result of the stricter controls in the U.S.A.*

*The WIA has under consideration a policy not to support any amateur service licence below that of the Novice grade. This had been suggested in several quarters as an alternative to CB or as a transitional stage between CB and Novice. Quite apart from international regulatory obligations there are a number of very cogent reasons why such a permit or licence could create fresh areas of difficulty and complexity. The decision will rest with the Federal Council.*

*Any member having thoughts about the ACADEMIC concept of CB in Australia would be wise to convey them to his Divisional Council. The Institute will have an opportunity to comment to Government when the question is thrown open for public debate. The attention of the Minister has already been drawn by the Institute to certain fundamentals which can be deduced, as likely to affect the amateur service, but actual detailed comments can only await the precise nature of the proposals if the political decision to introduce CB takes the next step.*

*Members are fortunate in possessing an Executive responsive to the changing circumstances surrounding radio Communications as a whole and which is quick on behalf of the amateur service to take advantage at the right moment in time of the constant changes going on around us.*

## EXAMS

*The Federal Education Officer held useful discussions with the head of the examinations section of the R.F.M.D. during October. It is understood that the marking of Novice examination papers will henceforward take place in State Offices and that the issue of a syllabus for this examination will be expedited by the Institute preparing one for the section to edit and amend., Consequently Mr. Scott promised to submit a suitable syllabus by the end of November.*

*Discussions on multi-choice type of questions for all amateur exams were carried one stage further and it is possible that future Regulations exam papers might well include a number of multi-choice questions plus a few essay type questions so as to preserve flexibility.*

*Pressure was exerted in relation to the need for a greater number of examination centres and the desirability of some thought being given to the invigilation of exams by responsible amateurs. Once again the response was unfavourable in the same way that the response was unfavourable to the increased frequency of examinations.*

*The submission that Novice exam morse speeds be altered to faster characters with larger pauses in between was again rejected. The RFMD follows the procedure laid down by ITU in the International Telegraph Regulations and any departure from these principles is regarded as likely to introduce unnecessary complexities particularly in the light of the proposed introduction of centrally prepared tapes by up to date mechanical methods*

*The principle of conceded Novice level passes in the AOCP theory exam — namely that those candidates obtaining some percentage below the 70% pass mark should automatically qualify for a pass at Novice level — was previously considered. However, a similar principle applied to the AOCP morse exam was received with considerable reservation.*

*It was apparent from the discussions that RFMD is conscious of the international reaction to changes in examination standards as affecting reciprocity. Any measures which would result in any loss of their direct control over examinations were viewed most unfavourably. This principle also acts in reverse. This results in Australia not recognising many overseas, and even academic, amateur licensing qualifications as acceptable either in relation to the syllabus studied or the nature and methods of conducting the examinations.*

*The thought that some suitable Australia-wide educational Institution should conduct examinations on behalf of the licensing authority — as, for example, the London City & Guilds Institute for U.K. examinations — remained merely as a thought.*

*One meeting of the Executive was held during October at which reports from the various Committees were received and debated.*

## REPEATERS

*One of the most intractible of problems is the condition* ***that*** *Radio Inspectors should be able to switch off any repeater in their areas at short notice if the need arises. This is still under discussion.*

*There arose a proposal that the time seemed ripe for holding another all-States repeater meeting similar to the last one in Wodonga some years ago. It was considered however that the expense involved in holding such a meeting appeared unnecessary when, in reality, the bulk of the difficulties related to adjacent areas in VK2 and VK3 in particular. A joint meeting between the State repeater committees immediately affected appeared more suitable.*

*A case for additional repeater channels on 2m (see WIANEWS Nov. AR) was believed to be imminently ready for submission. Arising out of this, when it comes to hand, will be the number and extent of active FM net frequencies. Details of the latter would be appreciated by the Federal Repeater Sub-Committee.*

*In connection with net frequencies an interesting development relates to the exchange of digital information with the aid of microprocessors now becoming more available for amateur use. Another topic discussed was the possible establishment of a repeater for RTTY.*

*The VHFAC bent their minds once again to the problems of TV channels O and 5A. This was reported by the Executive in AR for June 1975 page 31 paragraph 34. The difficulties centre round the 'long distance' reception of a channel O station in an area designated for a Ch. 5A translator. The 1976 ABCB report on this question may assist in providing additional material for consideration.*

*Feedback from Divisions concerning beacons and beacon planning had been negligible. This had retarded progress in this field. Since 'beacons' had been allocated to the VHFAC it was agreed as sensible that this committee would also undertake any planning work needed for 10m band beacons even though this was outside the VHF area.*

**PENSIONERS**

*A letter received during October from the Secretary of the P & T Dept. advised that the Minister had indicated his agreement to the reduction of licence fees from $12 to $2 for amateur radio operators in receipt of a pension under the Social Services Act subject however to the restriction of the concession to those persons whose pensions were granted subject to the standard means test provisions.*

*This entails an amendment to the Wireless Telegraphy Regulations which might cause some delay before the proposed concession becomes effective. Readers of WIANEWS will be aware of the efforts made by the Institute on this question over a long period of time. Letter RB4/4/32 of 19-10-1976 refers.*

**WICEN**

*The WICEN organisations of the Federal, ACT, Victorian, W. Australian, Nth. Queensland and some individuals joined together in the Natural Disasters Organisations' annual exercise "BACKUP" on 27th/28th October. Two concurrent disaster situations were simulated, bushfires in VK3 and a cyclone in VK6. Various Federal Departments, State Emergency Services, police, service personnel and others joined in the exercise at very short notice for many.*

*The Federal WICEN Co-ordinator, Brig. Rex Roseblade, VK1QJ, wrote that the exercise was very successful. Aside from demonstrating to NDO the usefulness of WICEN for the second year in succession, some valuable publicity was obtained for amateur radio and a number of lessons were learned from it. A letter of thanks for assistance by all concerned was received by the Federal President from Major-General Alan Stretton.*

*The call sign VK1WI was used in Canberra and the 'provisional' WICEN frequencies on the three HF bands were activated with stations identifying messages with the words "WICEN Exercise Station". Exercise traffic was relayed by VHF link to the home QTH of VK1QJ.* ■

## QSP—continued

during a raid in northern New Jersey on premises of those engaged in illicit 27 and 28 MHz operation. The report goes on to say that a photo of the seized equipment looks like the transceiver/amplifier counter at any well equipped radio store.

Under the heading "CB radio users jam airwaves, tune in trouble" the Ottawa Citizen details the problems with the General Radio Service, as it is known in Canada. Department of Communications officials are quoted as saying that closing the entire band might be the only solution if things continue the way they are going. The editorial continues: "Originally designed for urgent general purpose conversations, the system has become, in the words of a department official 'a refuse pile for the dregs of the radio community whose main interest is in hearing themselves ta!k'." Strong sentiments but they reflect a growing mood among government, radio enthusiasts and the public. — From Radio Com., Oct. '76.

**CB — U.S.A.**

The writer of "Zero Bias" in July 1976 CQ has much to write about CB and the continuing general hostility by radio amateurs. "Amateur radio", he writes "has a lot to offer on its own not at the expense of CB. If we take as fact that CBers like to communicate, buy equipment, put up antennas, engage in public service, seek out awards and QSL cards and intellectually disregard the ethics of legality of the situation, we can see the possibility of presenting an augmentation to their by rather than a replacement. What we have to offer and how we offer it may or may not be better; this is debatable from where you stand. What is true is that what we offer is different and unique. If you knock what somebody has or believes just to improve your own position you are in fact calling him a fool. Why should he continue to listen to you?"

**EARTHQUAKE EMERGENCY**

Ten resident radio amateurs in the earthquake devastation of N.E. Italy early in May alerted and carried traffic on the first night of the catastrophe when no other radio communication services were operative. They used three repeaters which were still operational as well as an 80m emergency net. A mobile repeater was used later on. Their efforts were rewarded in a public speech by the General Director of the Italian P. & T. Department in Rome. A detailed report about this emergency appeared in IARU Region 1 News of Sept. '75.

**NAVIGATION PROBLEMS**

For small craft enthusiasts the following edited extract from an article in Worldradio News of July 1976 might be informative. It was written by an amateur working as Radio Officer aboard both tankers and freighters. "Many yachts and other small craft often misunderstand and underestimate the manouverability of large ships. A tanker drawing 30 feet or more is often restricted to a channel and cannot turn without going aground. Small craft are very difficult to see at sea. A white hull and white sails are easily lost in the white caps of even the slightest sea. If a moderate-to-heavy sea is running, it is almost impossible to see a yacht. Remember, you can probably see us for miles due to our size and colour, but don't expect us to see you. Most wooden and fibreglass hulls provide a very poor radar target so make sure you have a good radar reflector installed on top of your mast so that you can be seen. Another factor to take into consideration is the visibility from the bridge of a large tanker. There is a distance of close to 700 feet (say, 230 metres) between the bow and the bridge, and if you approach too close to the bow or cut across her bow you are very easily lost to sight. That can be a very dangerous situation for a small craft."

**THOSE WERE THE DAYS**

Vince Kerr VK4LK has kindly forwarded a copy of "WIRELESS A Handbook of Instruction for Radio Enthusiasts" circa 1926. It contains over 100 pages of the (then) most up to date theory and practice. Also included are 8 most interesting pages listing Australian telephony stations. These included A and B class stations plus dealers stations as well as the experimenters (amateurs). Quite a few of the operators listed are still active; Harold Hobler VK4DO and Max Howden VK3BQ to name just two.

Other callsigns that were listed and are still going include 2BL, 2FC, 3LO, 3AR, 3UZ and 4QG.

Even then the "Call Book" had problems — 2WI was shown against two different operators and the 3B— series of calls preceded the 3A— series.

Australian and New Zealand ships equipped with radio were listed against their callsigns.

The advertisements are fascinating. A 1 valve set was available for £9 and 5 valve sets from £24-32. An RCA Raditron (valve cost 17/6 and 1.5V cells 3/-. Strange to think that all the latest gear advertised in this magazine today will seem quaint also in 50 years time. ■

# WIA EDUCATION

The Education Committee has met twice so far.

Graeme Scott VK3ZR is Chairman with John Wilson VK3LM and Peter Cossins VK3BFG as members.

All are teachers and have a background in Radio and Electronics teaching.

The committee set some priorities at its inception. The major one was to draw up suggested syllabi which instructors can follow in amateur radio courses. Also a published syllabus, if adopted by the P and T Dept. will lay down a framework for the course to which exam questions can be set. The Novice syllabus is expected to be handed to the P and T Dept. by Nov. 30th, 1976.

Interested persons are invited to forward suggestions, proposed syllabi for other exams, and multi-choice questions to the chairman via the Executive Office, Toorak.

The P and T Dept. recently asked the WIA to forward 100 multi-choice questions to create an exam bank. This has been done and further follow-up with more questions is welcomed from members. On the Youth Radio front there is little to report at present.

Graeme VK3ZR,
WIA Education Co-ordinator. ■

# "To Be or not To Be" — A "Ham"(let)

Doug Anderson VK3ZW, Director Victoria Promotion Committee.

We have all experienced the amused cum tolerant smile as the layman says "Oh so you're a ham are you?" and although my skin is relatively tough, the connotations of the word "Ham" and its consequent public relations value have often caused me to wonder why we accept such a title. I must confess I prefer the term "Amateur".

However, let the Oxford Dictionary (5th edition) be the judge. I quote an extract:

*"Ham* — (sl) an operator of an Amateur radio station. An inexpert performer or ineffective actor, one who rants and overacts, (sl) Hamfisted, Hamhanded, One who is heavy handed and clumsy".

*"Amateur* — One who cultivates a thing as a pastime".

Of course its either a matter of habit or taste and in some instances the observance of some obscure tradition that causes the term "Ham" to continue to describe us and our activities but for my part, if any of my neighbours regard me as a "Ham" when they experience their next dose of Hi-Fi I, then I hope they don't look me up in the dictionary. ■

# IC211

2 metres ssb/fm/cw

ICOM

**A great new wave** — **New Icom IC211 PLL synthesised Digital Transceiver**

ICOM introduces the first of a great new wave of Amateur Radios, with new styling, new versatility, new integration of functions. You've never laid eyes on a radio like the IC211, but you'll recognise what you've got when you first tune the single-knob frequency control on this compact new model. The IC211 is fully synthesised in 100 Hz or 5 KHz steps, with dual tracking, optically coupled VFO's displayed by 7-segment LED readouts, providing any split.

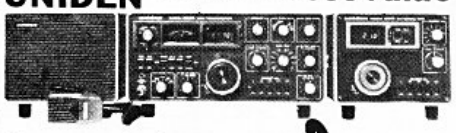
FEATURES:
- *Frequency memory, twin VFO's
- *Noise Blanker
- *Built-in SWR bridge
- *VOX
- *CW monitor
- *AC/DC operation
- *ICOM developed PLL
- *Devices incl. 92 transistors, 15 FET, 14 IC, 90 diodes, 1 LSI
- *144-148 MHz coverage
- *90 day VICOM warranty.

NEW

**$659**

IN FACT, THER ARE SO MANY FABULOUS FEATURES IN WOULD TAKE PAGES TO EXPLAIN THEM! FOR FURTHER INFORMATION AND SPECIFICATIONS PLEASE WRITE (ENCLOSING SAE)

# UNIDEN .... the best value



HF PLL Transceiver

More expensive than an FT101E ? New uniden 2020 Mark II

Featuring a number of circuit improvements as a result of a year in the field, the fabulous "2020" PLL transceiver offers separate usb/lsb/cw 8-pole filters as STANDARD and 6146B's in the final with screen grid voltage stabilisation for minimum distortion products. Features pcb's and even the front panel can be swung out for easy servicing. A comprehensive range of spare parts is available together with back-up service support. Overseas this rig sells for at least $65 more than the FT101E! Compare the features of the UNIDEN 2020 with other HF transceivers and you'll be quickly convinced that it offers the best value!

| | |
|---|---|
| UNIDEN 2020, complete | $649 |
| Digital VFO | $119 |
| Matching speaker | $ 38 |

Vicom for technical support

# ATLAS RADIO INC.

The fabulous Atlas 210X solid state transceiver with noise blanker $625

VICOM

# ICOM

.... where quality counts!

It's crystal clear

SYNTHESISED! NO CRYSTALS IC22S $220

The new IC22S (Special Australian Model) is a PLL synthesised rig with programmable ROM for frequencies in the Australian FM allocation. Simplex, duplex or duplex reverse is achieved by a flick of a switch on the front panel. This fabulous new rig features ceramic discriminator, IDC, electronic Tx/Rx relay, full swr protection and VICOM 90 day warranty. Circuitry includes 34 transistors, 7 FETs, 13 ICs and up to 128 diodes. Receiver sensitivity better than 0.4 dB for 20 dB quieting. Your new IC22S comes complete with mic, mobile mounting bracket, plugs, cable, spare diodes for programmable matrix and English Instruction manual (Aust. edition). You will never need to buy another crystal with the fabulous new - crystal clear - IC22S!

# PACESETTER

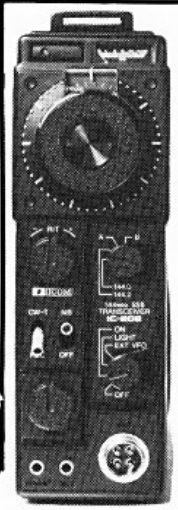
KENWOOD TS-820 PACESETTER

The 820 allows you to command the band with superb selectivity. Employs the latest phase lock loop circuitry. High stability VFO. Has a satin-smooth planetary drive VFO tuning dial system. The built-in monitor circuit allows you to hear your own voice during transmission. Uses an efficient noise blanker circuit. Incorporates a unique RF speech processor. During receive, a handsome, easy to read meter functions as an S-meter. The same meter displays ALC level, plate current, RF output and plate voltage during transmit. During CW reception, a special filter is used to alter the audio frequency response to provide a more comfortable, easy to copy tone. Has built-in speaker and 25 kHz calibrator.

**$800**

SSB Transceiver Kit

Includes all IF and AF signal circuitry for a fabulous SSB Transceiver designed by Applications Department of Plessey Semiconductors using their SL600 series of Integrated Circuits. The unit consists of a single PCB which requires only the addition of a local Oscillator, Preselector, Linear Amplifier, Volume Control, Mic and Speaker to make a complete Transceiver. The Transceiver may be used on any frequency from a few kilohertz to 500 MHz



# IC502 $185

Six metres during the DX season and using the IC502 can be great fun! This handy portable runs 3w pep ssb 52-53 MHz. Featuring VFO control, switchable noise blanker, RIT and provision for external power and speaker, 9 long-life C batteries factory produced English Manual and 90 day warranty. A comprehensive range of spare parts available. (serial no required when ordering parts).

# IC202 $195

The famous IC202 handy portable runs 3 watts pep with VXO control 144-146 MHz. Features noise blanker, RIT, lighted dial and meter, telescopic antenna and of course, that ICOM quality. Your new IC202 comes complete with mic, shoulder strap, connectors, batteries, English Manual (revised 2nd Edition) and 90 day warranty.

# SPECIAL KEN CRYSTALS

Repeaters 2, 3, 4, 5, 6, 7, 8, Simplex 40, 49, 51. Anti-repeat 2. A few only at this price!

**$5.00** PR

# LINEAR FOR TWO $98

All solid state 70w pep (ssb) output linear amplifier (for 14w pep input), 12 vdc operation and internal automatic RF sensing switch means that you only need to connect this unit in your 2m antenna line together with a source of 12 vdc for 10w pep OUTPUT. Accepts ssb, fm, am, or cw with switchable hang time for ssb and cw operation. Supplied complete with dc power cord and fitted with SO239 sockets. $98.

# TRANSVERTERS 2M High Power

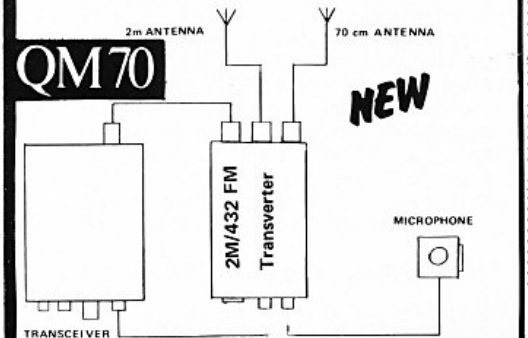
28/144 HIGH POWER TRANSVERTER. A 10 m to 2m hybrid transverter offering up to 200w pep input. Excellent FET receive converter with two IF outputs fitted as standard. Master oscillator is doubly stablilised and the pa section is well ventilated. Takes all drive and switching from your 10m rig. Built-in antenna change-over relay, metering and power on warning neon. Complete with harness and plugs for connection to your 10m rig. $198.

2M/432 FM Transverter

This small unit obviates the need for the expense of a second transceiver or the complexity of numerous add on units with multiple connecting leads. By simply inserting the unit in the antenna lead of your 2m fm transceiver you are ready to transmit and receive on either 2m or 70cm AT THE FLICK OF A SWITCH! The unit has its own 70 cm to 2m receiver converter built in and all switching is carried out within the unit. Size 105 mm x 40 mm x 180 mm. Supplied complete with power cord and mobile mounting bracket. Price $110.

# QM70

NEW




# ** PORTABLES

This is ICOM's first FM portable, and it puts good times on the go. Change vehicles, walk through the park, climb a hill, the ICOM quality FM communications go right along with you. Long lasting internal batteries make portable FM really portable, while accessible features make conversion to external power fast and easy!

- Fully collapsible antenna
- 15 channels (12 on dial and 3 priority)
- Dual power - 3 watts high/400 mW low, nominal
- Lighted dial and meter
- 36 transistor, 3 FET, 2 IC, 51 diodes
- super sensitive receiver
- Crystal specifications identical to IC22a

# IC215

**$169**

ICOM

Your new IC-215 comes supplied with; 3 popular channels, handheld mic with protective case, shoulder strap, connectors for external power and speaker, 9 long-life C batteries, English manual and 90 day warranty

Vicom for personalised service

# CONVERTERS

Utilising modern technological design features and built to demanding specifications, this range of Converters has been produced to meet the increasing requirements of High Performance Equipment.

144/28 CONVERTER
- 116MHz Crystal Oscillator; Maximum Frequency Error 1 khz
- Mosfet RF Amplifier Inductively Coupled to Mosfet Mixer
- All Signal Path Inductors utilise Printed Stripline for long term performance stability.
- Gain = 28 db (typical)
- Noise Figure = 2.5db (typical)
- Power Requirements 12V DC Negative Earth @ 16mA (typical)
- I.F. = 28-30 MHz
- Aerial and I.F. Sockets both BNC as Standard

**$36**

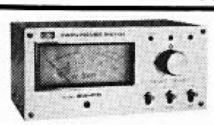
432/28 CONVERTER
- 101MHz Crystal Oscillator; Maximum Frequency Error 1 KHz
- Two R.F. Amplifier Stages in cascade using Printed Stripline tuned circuits before AND after each Stage.
- Dual Gate Mosfet Mixer for excellent cross modulation immunity
- Gain = 30 db (typical)
- Noise Figure = 3.5 db (typical)
- Power Requirements 12V DC Negative Earth @ 35 mA (typical)
- I.F. = 28-30 MHz
- Aerial and I.F. Sockets both BNC as Standard

**$41**

1296/28 CONVERTER
- 105.66 MHz Crystal Oscillator
- Hybrid Ring Mixer utilising Schottky Diodes
- Dual Gate Mosfet I.F. Head Amplifier
- All UHF/SHF Tuned Circuits use Printed Striplines
- Gain = 25 db overall
- Noise Figure = 8db (typical)
- 12V DC Negative Earth
- I.F. = 28-30 MHz
- Aerial and I.F. Sockets both B.N.C. as Standard

**$56**

All Units housed in attractively finished and sturdy Die-Cast Boxes



Quality VHF/UHF swr power meter, pwr up to 120w, no power calibration required. Superb construction. $95

# SW-410

# NOVICE

BUILT-IN SWR BRIDGE!

**NEW $140**

COUGAR 23 B AM DELUX TRANSCEIVER

Delux mobile 23 channel (synthesised) for the quality conscious Novice. The Cougar features built-in swr meter, noise blanker, delta tune, rf gain control, mic gain control, built-in modulation meter, separate PA switch. Circuitary consists of 1 IC, 20 transistors, 18 diodes. RECEIVER: dual conversion, sensitivity 0.5 uV for 10 dB S+N/N, selectivity 6 dB bandwidth 5 kHZ, PA audio power 5 watts. TRANSMITTER: 5w input, spurious harmonic suppression better than 55 dB. Comes complete with mic, mobile bracket, dc cable and manual.

# hy-gain

for the finest in Ham Radio Antennas! QUALITY USA ANTENNAS

14AVQ/WB, 40 thru 10m quality trap vertical, 19' high. True 1/4 wave resonance on all bands $ 79
18 AVT/WB, The great wideband vertical performed 80 thru 10 metres. Self supporting, 24' high $ 99
TH3MK3 3el beam 10/15/20. 14' boom, oustanding performance at reasonable costs $198
TH3JR 3el beam 10/15/20, 12' boom. Ideal for top performance in limited space $152
TH6DXX 6el Super Thunderbird, impressive coverage on 10/15/20 metres. SWR less than 1.5:1 on all bands $245
BN86 Balun for the above beams $ 25
AS203W (Asahi) 20m monobander, 3el, 8 dB gain $160

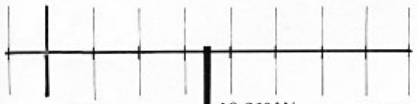
## GO MOBILE HF MOBILE ANTENNAS

AS303A antenna set 80 thru 10 metres, centre loaded, incl. heavy duty ball mount and spring $118
Quality Hustler Resonators, precision wound with optimum design for each band, adjustable tip rod for lowest swr:

| | | | | | |
|---|---|---|---|---|---|
| RM80 | (80 metres) | $26 | RM20 | (20 metres) | $21 |
| RM40 | (40 metres) | $25 | RM11 | (11 metres) | $17 |
| MO2 Mast | | $24 | RSS-2 Spring | | $9.60 |

Bumper Mount Assembly Model ASNK. Zinc plate steel and stainless steel. $18
ASKDA Heavy Duty Spring and base assembly. Chrome plated steel swivel ball $11.50
AS-GM gutter mount $10
M-ring body mount $ 5

## 2M ANTENNAS



$49 AS-210AN 14.5dB

AS210AN 2m 10el beam with 14.5 dB gain, F/ 20 dB. Boom length 4 metres, weight 3 Kg $49
AS210BN 2m twin 10el, 18 dB gain, F/B 20 dB. Boom length 4 metres weight 6.8 Kg $99
Lindenow quality 5/8 wave 2m mobile whip, heavy duty $26
Model Y7 crossed yagi 7el 7dB gain $65

## NEW FM GAIN RINGO RANGER

The new Ringo Ranger ARX-2 2m omnidirectional offers 6dB gain over a ¼ wave whip. Features 3 half waves in phase and a 1/8 wave matching stub with an extremely low angle of radiation for better signal coverage. Tunable over a broad frequency range and perfectly matched to 52 ohm coax

$40

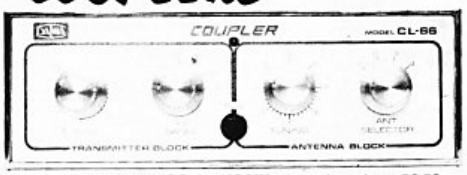
## HAM II CD44 CDE

CONTINUING THE TRADITION OF THE HEAVY-DUTY CAST ALUMINUM, IN-LINE ROTORS, SUPPORTING BIG VERTICAL LOADS ON TWO SIX INCH RACES & BALL BEARINGS. BOTH MODELS HAVE A HUSKY 800 IN/LB TURNING TORQUE. THE STRIKING NEW CONTROL BOX HAS A FRONT PANEL CALIBRATION CONTROL WITH SEPARATE ON/OFF CONTROL FOR CONTINOUS METER INDICATION AND INDIVIDUAL SNAP ACTION SWITCHES FOR EACH DIRECTION ROTATION. NORTH CENTER.

CDE Ham 11, Heavy Duty, designed for large beams up to 7.5 sq ft wind area, positive electrically operated wedge brake with 96 segments spaced 3° 45' apart. 240v model complete with control box. 8 core cable available $195
CDE CD44 Medium Duty type, 240v complete with control box $155

**Quality USA Rotators**

## COUPLERS




CL66 500 w pep max, 3.5 thru 29 MHz, input impedance 50-70 ohms, output impedance 10-600 ohms unbalanced. Includes 4 position coax switch $118

DAIWA

VALUE!

## ALL IN ONE!

CSW216 All-in-one includes quality swr/pwr meter. Antenna matching 3.5-28 HMz, pwr/swr 1.8 to 150 MHz 20/200 watts. Insertion loss better than 0.5 dB. A real bargain! $175
CL666 Heavy duty (2.5 Kw) 1.8 thru 28 HMz will handle output impedance 10 to 600 ohms unbalanced $235
CL99 for 2 metres. Max pwr 200w pep, output 10-200 ohms unbalanced $ 58

POPULAR EIMAC TUBES, BASES ETC.
WHY NOT MAKE A LINEAR THIS SUMMER?

| | | | |
|---|---|---|---|
| 4CX250B | $ 40.00 | 3-500Z | $ 69.75 |
| 3-400Z | $ 68.00 | 4X150 | 37.50 |
| 4CX1000A | $340.17 | 4125A | $ 60.22 |
| SK600A | $ 29.20 | SK606 | $ 6.75 |
| 8873 | $115.00 | 8874 | $115.00 |

AND MANY MORE!

## BALUNS

BALUNS for coupling 52 ohms unbalanced transmission lin into a 52 ohm load balanced system such as a beam or double antenna. It improves the transfer of energy to the antenna eliminating stray RF from the feedling. When a beam antenn or dipole is fed directly from coax cable, there is an unbalance condition due to currents flowing down the outiside shield o the coax. These currents radiate and thus effect both th pattern and the front to back ratio. In addition they case TV and drain away effective power.

BL 50A quality heavy duty dipole type, 4 Kw pep, 2 KW an 1.8 thru 38 MHz, 52 ohms, vswr better than 1.2 at 30 HM Housed in sealed cycolac which will withstand 250 Kg tensio Price $22. BL70A (72 ohm model) $24.
BN86 (Hy-Gain) for beams. Covers 3-30 MHz handles up t 1 Kw dc. Negligible insertion and feed-thru loss. VSWR 1: when terminated into 52 ohm load.
ASBL (ASAHI) for beams, 3-30 MHz, max 1 Kw. $26

Popular VC2 swr/pwr meter operates 3-150 MHz with power measurement 12/120 watts. Will handle up to 1000 watts. 50 ohms impedance, twin meters. A bargain! $29.80

## SWR/PWR METER $29.80

## RECEIVERS FOR THE SERIOUS SWL!

Yes, the famous Barlow Wadley general coverage receiver with crystal controlled reception of am/lsb/usb/cw now includes the Australian FM band!
BARLOW WADLEY
STANDARD $269 + P&P
WITH FM $298 + P&P

The new Yaesu FRG-7 general coverage receiver features ac/dc operation and the famous Wadley Loop principle with spin tuning and phase-locked synthesiser providing complete coverage from 500 KHz to 30 MHz with an accuracy better than 5 KHz. Please write for further technical details (enclosing SAE)
OUR PRICE $275 + P&P

## ANTENNAS

Listener 1 "V" type antenna. Covers 3-30 MHz with special trap. Ideal for DX reception. $21 + P&P
Listener 3 Long Range wire dipole antenna 3-30 MHz complete with balun, feed wax, VHF plugs, insulators. Ideal for the serious SWL $42 plus P&P

## Mic Compressors

for those extra "s" points

Increase average "talk power" by connection to the transmitter microphone circuit.
Model MC33A ac/dc includes tone generator and built-in compression level meter $65
Model CM22 as above, with iut compression meter $54

RAC ANTENNA

Now appears in a completely new style

## LOADED DIPOLE

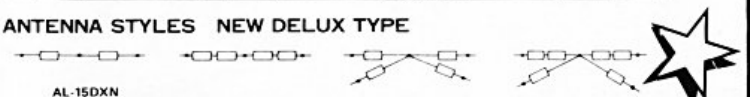
AL-48DXN and AL-24DXN

Equipped with the new traps that combine the merits of linear loading and colinear loading.
Wire and wire locks ... 52S type
Hardware (screws, nuts, washers) ... stainless steel
New Deluxe series, designed for easy installation rather than for additional shortening.
Almost no need of adjustment for any band. May be mounted in non-standard configuration.

| | | | |
|---|---|---|---|
| AL48DXN | $40 | + $2 | P&P |
| AL24DXN | $40 | + $2 | P&P |
| AL15DXN | $45 | + $2 | P&P |
| MIDY 11N | $45 | + $3 | P&P |
| MIDY 111N | $45 | + $3 | P&P |
| MIDY VN | $48 | + $4 | P&P |

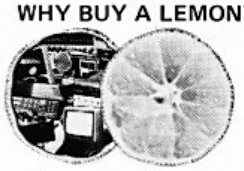
| Model | Description | Impedance | Freq. | Power | VSWR | Overall Length | Net Weight |
|---|---|---|---|---|---|---|---|
| AL-48DXN | New Deluxe type, Duoband Loaded Dipole | 52 ohm | 3.5, 7MHz | 2KW PEP 1KW CW | Less than 1.2/1 80KHz | 28m | 1.2Kg |
| AL-24DXN | | 52 ohm | 7, 14MHz | do | do | 14m | 900g |
| AL-15DXN | | 52 ohm | 21, 28MHz | do | do | 6m | 870g |
| Midy-II N | New Deluxe type, Multi-band Loaded Dipole | 52 ohm | 3.5, 7, 14MHz | 1.5KW PEP 750W CW | Less than 1.3/1 50Hz | 23m | 1.4Kg |
| Midy-III N | | 52 ohm | 7 ~ 28MHz | 2KW PEP 1KW CW | do | 14m | 1.4Kg |
| Midy-V N | | 52 ohm | 3.5 ~ 28MHz | 1.5KW PEP 750W CW | do | 23m | 2.2Kg |

## ANTENNA STYLES NEW DELUX TYPE

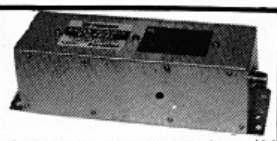


AL-15DXN AL-48DXN, AL-24DXN | Midy-II N | Midy-III N | Midy-V N

## WHY BUY A LEMON?



Any transceiver, irrespective of the brand or model could turn out to be a lemon - it often depends on where you made the original purchase. At VICOM all equipment is given a thorough pre-delivery checkout, support by technical expertise and well equiped workshops. A 90 day warranty is offered on all new gear to!



Superb quality low pass filter (34 MHz cut-off) will handle up to 1 kW pep. 50 ohms impedance with insertion loss better than 0.3 dB. Copper construction with SO239 sockets. $29

TVI PROBLEMS ?

PLUGS AND SOCKETS (minimum mail order $5)

| | |
|---|---|
| P1259 plugs with reducer | $1 |
| SO239 chassis socket | $1 |
| SO239/PL259 tr angle connector | $1 |
| SO239 3 female "T" adapter | $2 |
| "T" connector | $2 |
| Solderless in-line splice | |
| 18" coax jumper lead with PL259s | $2 |
| 3' coax jumper lead with PL259s | $2 |
| 3 pin mic plugs and sockets | $1 |
| 4 pin mic plugs and sockets | $1 |
| RG58A/U 52 ohm coax - 45c/metre | |
| RG8 low loss coax - 45c per foot | |

$22

## CS-201

CS201 quality 2 position coax switch. Will handle up to 2.5 Kw pep. 50 ohms imedance, insertion loss better than 0.2 dB up to 500 MHz. Separation better than 60 dB.

## HI-MOUND

1. ECONOMY KEY, chromium plated parts with a steamlined transparent cover. Hard silver contacts $18
2. QUALITY KEY, smart appearance, chronium plated keying mechanism, spring adjustment $19
3. HEAVY DUTY DELUXE KEY, fully adjustable, ball bearing shaft, plastic protective cover $28
4. MANIPULATOR (Side swiper) for an electronic keyer. Accurate and restful keying operation assuring owing to heavy metal plate and frictional rubber belt beneath the periphery of the main base $29.50

Morse Keys

## VICOM

DIRECTION: Russell Kelly, VK3NT
Peter Williams, VK31Z

Head Office & mail orders . . .
**139 Auburn Rd, Auburn, Vic. 3123 Ph: (03) 82-5398**
Sydney Branch . . .
**23 Whiting St, Artarmon, NSW 2064 Ph: (02) 439-1271**

DEALERS:

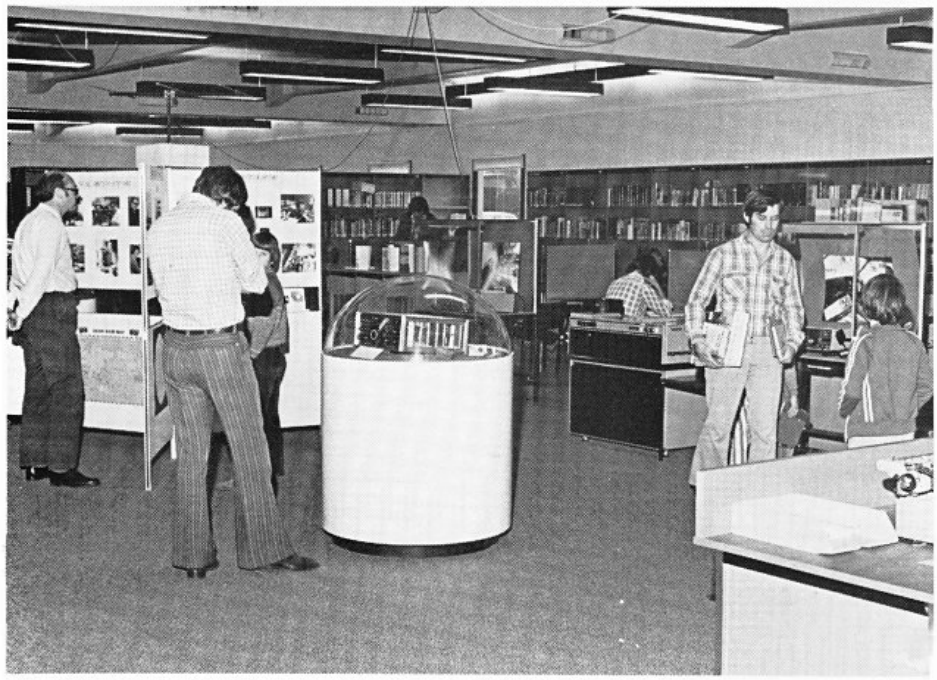
| | |
|---|---|
| Perth: | Netronics, 388 Huntriss Ave., Woodlands Phone 46 3232 |
| Adelaide: | Graham Stallard, 27 White Ave, Lockleys Phone 43 7981 |
| Canberra: | Daicom Electronics, 29 Colbee Court Phillip Phone 82 3581 |
| Brisbane: | Elite Electronics, 69 Wardell St Dorrington, Phone 38 4480 |
| Newcastle: | Digitronics, 188 Parry St, Newcastle Phone 69 2040 |

Prices include Sales Tax but exlude freight and insurance. For insurance allow $1 per $100, minimum $1. Freight sent Kwikasair (freight "collect") unless otherwise specified. Prices and specifications are subject to change without notice.

# WHO ARE YOU?

Mike Thorn VK3ZVN

**In October 1975 the Eastern and Mountain District Radio Club changed its venue from the Mooroolbark Technical School to the C.L. Willis room in the Nunawading Civic Centre. At its first meeting in the new venue, the club was addressed by the then Mayor of Nunawading, Cr. Peter James. Of the many topics that Peter spoke about perhaps the one that really struck home was "Who are you? No one in the eastern suburbs has heard of you and what you do".**



**OVERALL VIEW OF THE DISPLAY AT THE LIBRARY**

Like most other amateurs, we had taken the view that it was impossible to get publicity in the local press and therefore, did nothing about trying. However Peter's words did not fall on stoney ground and at subsequent committee meetings much discussion centred around publicity and what we could do. As a result, earlier this year, it was decided to approach the Head Librarian at Nunawading Library. Members had noted that the library regularly had static displays of various skills and crafts, why not amateur radio? There was only one way to find out. Very tentatively, I made an appointment to front the lion in its den.

To my delight and surprise I was greeted as manna from heaven. A local organisation was actually interested in its library! The library staff, led by Constance Pavey, the Head Librarian, were actually grateful to us for offering to put on a display. Very quickly a date was decided, it was to be National Library Week, 11-18th September.

To put it mildly, we were on the spot. No-one had anticipated quite that reaction. and we had only a few short months to get it all together. Planning began immediately. Fortunately the library had four large show cases and two domed display units. A visit to the library with a tape measure to get the sizes of the show cases and to decide what to put where. The final layout decided by sub-committees was for a central photographic display with the showcases around it in the central area of the library. Each of the showcases was to cover a specific subject i.e. Test equipment in one, antennas in the second, VHF Mobile/portable equipment in the third and HF equipment in the fourth.

The two domes would contain home brew equipment. A portable station would be installed in the foyer on each Saturday.

The search for suitable photographs began and here again we struck it lucky. One of our newer club members, Reg Gouge, was a keen amateur photographer. Reg was very quickly railroaded onto the sub-committee with a brief to obtain suitable photographs. An approach was made to both the Federal Executive and to the Victorian Division. Very willing help was given by both and photographs and literature provided. The final layouts of cases and display boards was decided upon and equipment for the portable station in the foyer had been arranged.

On the evening of Friday 10th, a shower of equipment, amateurs, photographs and other display material descended on the library and with much rushing around and numerous cups of coffee, all was nearly ready for library opening time the next day.

Unknown to us the librarian and her staff had earlier prepared and printed a supply of handbills and these had been despatched to all schools, business houses and various community organisations throughout the City of Nunawading. In addition, several large posters had been displayed in the library itself.

Saturday morning and about an hour before opening time, club members arrived to set up the portable station in the foyer and to put the finishing touches to the static display. Finally all was ready and we waited to see what sort of response there would be from the public. It was enormous. The library was crowded all day and great interest was shown in the Static display and the station.

**WHAT DID IT ALL ACHIEVE?**

Constance and her staff were delighted at the public's response. Using their measuring sticks of book issue and new enrolment, book issue was the third highest ever, and new enrolments doubled the Saturday norm. So obviously the involvement of the library in the exercise was worthwhile.

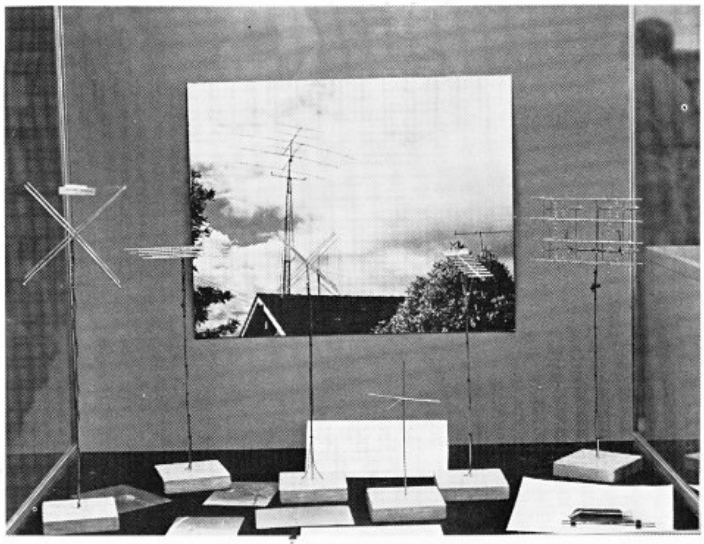
Constance has already spoken to other librarians around Melbourne and from what she tells me, the interest is very high. There doesn't appear to be any reason why the same interest shouldn't be evident in other parts of Australia.

From our point of view it was also a success. Although we did not have a means of objective measurement, we feel we succeeded in our main aim of showing the public what amateur radio was all about. Of course, we gained some new members, but it was not meant to be a recruiting exercise.

We've learnt from the exercise too. We should have had the station operating each evening the library was open. There is a need to display information on the QSO in progress. It is very hard to hear what the operator is saying so the audio on transmission needs to be broadcast on the extension speaker as well as the received audio.

As far as the static display went, we wouldn't do it very differently next time — and there will be a next time without doubt. The local newspaper printed a follow-up article as well as announcing the display in the issue in the week prior to Library Week. So we gained valuable publicity in the local press as well.

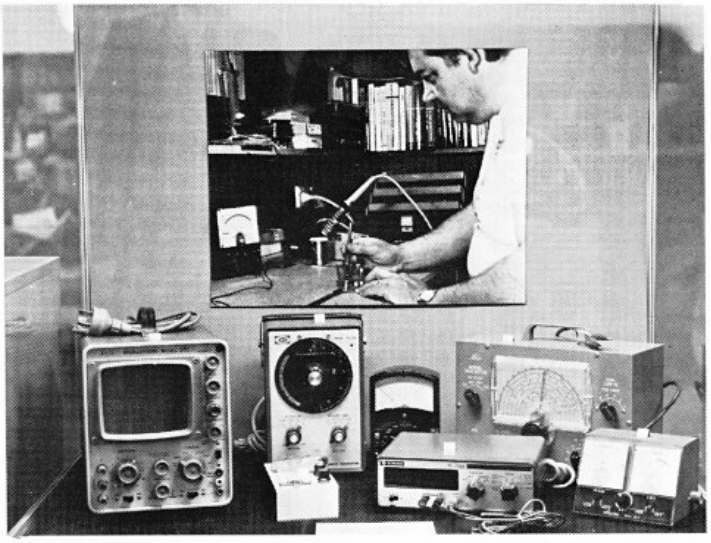
If any Club or group would like to know more about the details of mounting such a display, write or call the Club Secretary P.O. Box 87 Mitcham, Victoria, 3132, and we will be only too happy to assist in any way we can. ■



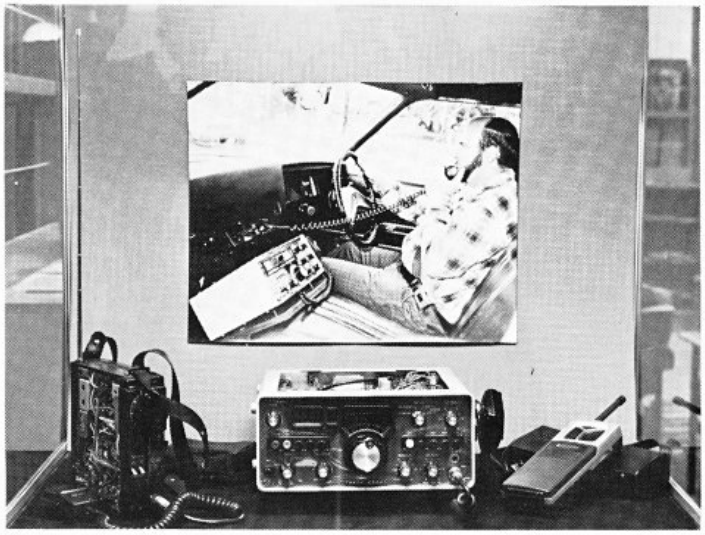
THESE MODELS DISPLAYED WERE BUILT BY NICK VK3ZND

PART OF STATIC DISPLAY WITH WALL PHOTO OF JOHN VK3JH

HOME BREW EQUIPMENT UNDER PROTECTIVE COVER — TO LOOK BUT NOT TOUCH



STATIC DISPLAY



WALL PHOTO OF MOBILE INSTALLATION AND DISPLAY OF POPULAR HF TRANSCEIVERS

INTERESTED ONLOOKERS AT PICTORIAL INFORMATION BOOTH

(Photos by Bill Rose)

# MEASUREMENTS ON LINEAR AMPLIFIERS

## AN AUDIO STAIRCASE GENERATOR

R. A. J. Reynolds VK3AAR

**During and following the development of the VK3AAR Linear Amplifier (AR April, May and June '76) I became interested in measurements on sideband amplifiers, and in tuning methods. Whilst a lot of what was learned is of not much more than academic interest, several observations were made which are worth repeating. I don't for a minute suggest that these observations are "previously unknown", but from some of the sounds that you hear on the air, a lot of operators have forgotten.**

The first observation concerns power and VSWR meters. Whilst the low cost parallel line SWR meters do provide a reading that is related to the real SWR, they are rather sensitive to voltage levels on the line. As a result, readings vary with position on the line and with the input power level. Link type meters that are really directional power meters, Sierra, Bird thruline, Collins etc., do not suffer from this problem to anywhere near the same extent. The unfortunate part of it is that the lesser VSWR meter errs very much on the optimistic side. A feedline which showed 1:1 on a Hansen FS5 showed 1.5:1 on a Bird Ham-Mate 4351. Introduction of some more cable between the load and the measuring point left the Bird meter much the same, but inspired the Hansen meter to read 1.3:1. Now we all know that for a lossless system, the VSWR is constant along the line, and 1.5:1 is probably the right figure. I am indebted to Tom, VK6MK for drawing to my attention an article in CQ for July 1975, which treats this subject in somewhat more detail.

The second observation concerns that wide subject of tuning, loading, output and linearity, all of which are interdependent. I touched on this subject briefly in the construction article mentioned above. Playing with a normal power amplifier with Pi-coupler output fitted with a power output meter and a monitor-scope or high frequency oscilloscope, will soon display the following observations.

If output coupling, or loading, and tuning are optimised for each of various input conditions, say single tone at full power, tenth power, 2-tone, and voice, it will be found that it is possible to tune towards maximum power on the meter, or maximum amplitude on the 'scope screen. A whole range of settings for the load and tune knobs will be discovered, and depending on the design of the amplifier, the comparisons will not necessarily be the same.

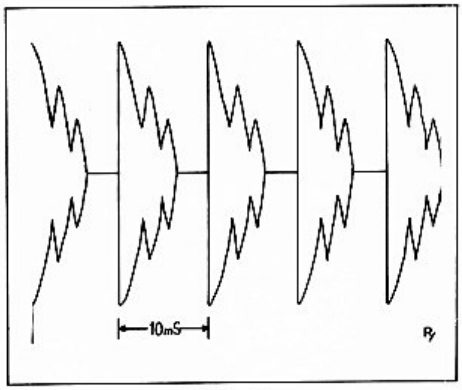



FIG. 1

The problem is: under what conditions should an amplifier be adjusted, and to what parameters? Surely it will depend on the service for which the amplifier is to be used. RTTY or SSTV will have a fairly fixed duty cycle under signal conditions, and a static output can be displayed on the scope, and the amplifier can be adjusted accordingly. For CW, single output level from a mechanical "ditter" will provide a usable signal. But what do we do for voice? There is a wide peak to average energy ratio range to be found amongst operators' voices. We have all heard the "peaking" and "smooth" voices, to consider the extremes. Have a look at the waveform of your voice (at audio frequencies) on an oscilloscope, experiment with various sounds, and you will discover that there is considerale variation in the peak to average energy ratio within one voice, let alone from voice to voice. However, considering no distortion, a couple of things are obvious.

(1) The ratio is nothing like single tone.

(2) The ratio is nothing like 2-tone.

Yet these are the two most common

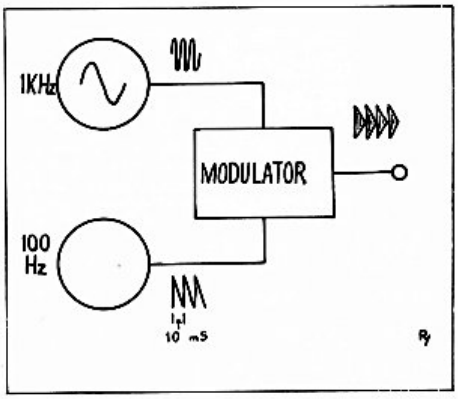
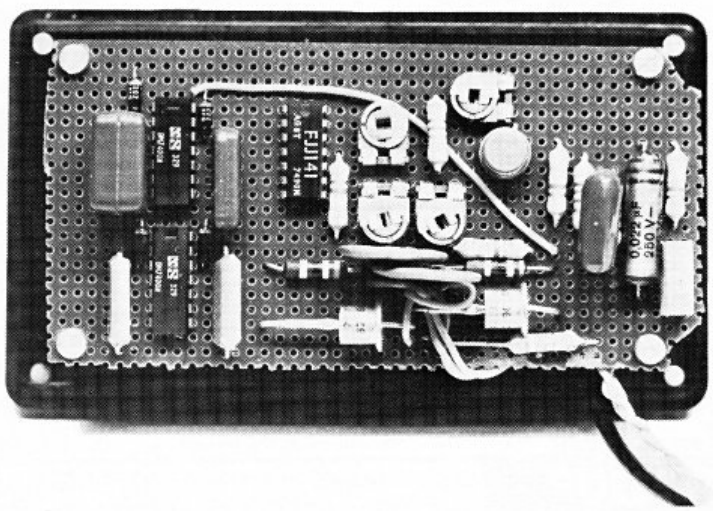



FIG. 2



COMPONENT LAYOUT — AN AUDIO STAIRCASE GENERATOR
Photo: Ken Reynolds VK3YCY

# DICK SMITH FOR ALL AMATEUR RADIO EQUIPMENT..


## HF EQUIPMENT

| | | |
|---|---|---|
| Cat D-2520 | Kenwood TS520D transceiver, 80 – 10m, SSB/CW. 240V & 12V operation. | $570.00 |
| Cat D-5201 | Kenwood VFO-520 remote VFO for TS520 transceiver. | $99.00 |
| Cat D-5202 | Kenwood SP-520 remote speaker for TS520 transceiver. (Also for TS820 - see below) | $34.00 |
| Cat D-2110 | Kenwood TS820 transceiver, 160 – 10m, SSB/CW/FSK. | $800.00 |
| Cat D-2111 | Kenwood VFO-820 remote VFO for TS820 transceiver. | $137.00 |
| Cat D-2112 | Kenwood DG1 digital display (option for the TS820 transceiver) | $154.00 |
| Cat D-2530 | Atlas 210 transceiver, 80 – 10m, 200W input, SSB & CW. | $599.00 |
| Cat D-4306 | Hy-gain TH3MK3 antenna, 3 el. beam, 20, 15 & 10 m. 8.5dB gain, 1kW rating. | $195.00 |
| Cat D-4308 | Hy-gain TH6DXX antenna, 6 el.beam, 20 15 & 10 m. Fantastic F/B ratio. | $238.00 |
| Cat D-4301 | Hy-gain 18AVT antenna, 24ft all band vertical (80 – 10) Robust construction. | $93.00 |
| Cat D-4300 | Hy-gain 14AVQ antenna, 40, 20, 15 & 10m. 19 ft vertical. | $140.00 |
| Cat D-4705 | RAK 5BQN antenna, dipole for 80, 40, 20, 15 & 10m. SWR 1.2:1, 2kW rating. | $39.75 |
| Cat D-4704 | RAK AL80/40DX antenna, loaded dipole for 80 & 40m, 52 ohms. Max legal power. | $69.00 |
| Cat D-4150 | Hustler 4BTV antenna, 40 – 10m vertical. Max SWR 1.6:1, 21.5 ft high. | $99.00 |
| Cat D-4152 | Hustler MO-1 mobile mast, suits all RM - - series resonators. | $25.50 |
| Cat D-4154 | Hustler MO-2 mobile mast, as above but bumper mounting. | $25.00 |
| Cat D-4156 | Hustler RM80 resonator for 80 metres, suits MO-1 or MO-2 (see above) | $26.50 |
| Cat D-4158 | Hustler RM40 resonator for 40m | $25.50 |
| Cat D-4160 | Hustler RM20 resonator for 20m | $21.50 |
| Cat D-4162 | Hustler RM15 resonator for 15m | $21.00 |
| Cat D-4164 | Hustler RM11 resonator for 11m | $17.00 |
| Cat D-4166 | Hustler RM10 resonator for 10m | $17.00 |
| Cat D-4170 | Hustler SSM2 antenna mount (mobile) inc. 180° adj. stainless steel ball. | $22.50 |
| Cat D-4180 | Hustler MM1 cowl mount, includes 180° ball and SO-239 skt. Accepts PL259 plug. | $9.50 |
| Cat D-7010 | Dummy load, 50 ohms, rated 100W cont. (int. would be far higher) | $19.75 |
| Cat D-7080 | Shinwa 1005 TVI filter, low pass 30MHz, 52 ohms, loss 0.7dB, max. attn. 50dB. | $19.75 |
| Cat D-7190 | MC-701 microphone compressor, 25dB max, fully variable, internal batteries. | $39.50 |
| Cat D-5500 | HC-500 antenna coupler. Tunes any antenna for 1:1 SWR, 3.5 – 30MHz. 52 ohms input. | $139.00 |
| Cat D-7200 | 6KD6 transmitting valve | $8.55 |
| Cat D-7201 | 6SJ6 transmitting valve | $8.25 |
| Cat D-7202 | 6146 transmitting valve | $9.00 |
| Cat D-7203 | 6LQ6 transmitting valve | $12.00 |

## NOVICE EQUIPMENT

| | | |
|---|---|---|
| Cat D-1700 | Midland 13-892 transceiver, SSB/AM, 11m, 23 channels. RF gain controls, etc. | $239.50 |
| Cat D-1436 | Midland 13-882C transceiver, AM, 11m, 23 channel , delta tune, ant. warning light. | $149.50 |
| Cat D-1430 | Midland 13-830 transceiver. 11m, AM for budget minded. 23 channels, 5W input. | $109.50 |
| Cat D-4142 | Mobile 1 Helical antenna. 11 metres, covered in durable plastic. B/Lee base. | $20.00 |
| Cat K-3134 | Novice Transvertor Kit. Build yourself. 27MHz to 3.5MHz novice channels. Max. output. | $99.50 |

## VHF EQUIPMENT

| | | |
|---|---|---|
| Cat D-3100 | Kenwood TS700A transceiver, 2m, SSB, FM, CW, & AM. AC/DC, 22 channels. | Special: $599.00 |
| Cat D-3007 | Multi 7 2m transceiver, 23 channel capacity (one channel fitted) FM. | $189.00 |
| Cat D-3010 | Multi 2000A transceiver, SSB/CW/FM, 2m. 144 – 148MHz in 10kHz steps. AC/DC. | $550.00 |
| Cat D-3050 | Kyokuto FM144 10SX transceiver. Synth. FM, 144 – 148.995MHz. 10W or 1W output. | $315.00 |
| Cat D-3500 | Europa B transvertor, 28-30MHz to 144-146 MHz. Capable of any mode trans. uses. | $239.00 |
| Cat D-3502 | Kenwood TV-502 transvertor, suits TS520 transceiver, ouput 144 – 146MHz. | $240.00 |
| Cat D-3040 | Icom IC202 transceiver, 2M, SSB & CW. Covers 144 – 145MHz, comp. portable. | $183.00 |
| Cat D-4620 | Green GA6020 antenna, 5/8 144MHz; 1/4 50MHz. S/steel whip, 1.3m long. | $22.50 |
| Cat D-4200 | Hustler G6 144A colinear base antenna, shunt fed, SWR 1.2:1. Stands 100mph wind. | $79.00 |
| Cat D-4600 | 3Y2D antenna , 3 element beam for 144 MHz, gain of 5dB, knocks down for portable use. | $14.00 |
| Cat D-4610 | RAK 42S antenna, 1/4 wave 144MHz, s/steel whip, standard PL259 plug base. | $6.75 |
| Cat D-4611 | RAK 82S antenna, 5/8 wave 144MHz, s/steel, 1.25m whip, PL259 base. | $9.75 |
| Cat D-4650 | Antenna element bracket , takes 3/8in rod for making beam antennas. Insulated type. | $0.45 |
| Cat D-2561 | NAG50XL linear amplifier for 6m band, 10W driver for 100W out, inbuilt supply. | $379.00 |
| Cat D-2560 | NAG144XL linear amp for 2m band, same specs as above unit. | $379.00 |
| Cat D-2807 | Daiwa SR9 receiver, 2m, FM, 11 channel plus VFO 146 – 152MHz. 12V DC. | $97.50 |
| Cat D-3806 | Ham Prods ERB6 RF amplifier, 6m , 20–30dB gain for rec. 9 – 12V DC @ 15mA. | $21.50 |
| Cat D-3802 | Ham Prods ERB2 RF amplifier, 2m, same specs as above. | $21.50 |
| Cat D-3832 | Ham Prods. EXC2 converter, 2m, for 52-54 MHz, IF output on 28–30MHz. | $27.50 |
| Cat D-3836 | Ham Prods. EXC6 converter, 6m, for 144-146MHz, IF output 28–30MHz. | $27.50 |

## SWL EQUIPMENT

| | | |
|---|---|---|
| Cat D-2850 | Yaesu Musen FRG-7 receiver. 550kHz-30MHz, Wadley Loop. 240/12V, 0.25uV sensitivity. | $275.00 |
| Cat D-2866 | Kenwood QR-666 receiver. 170kHz-30MHz. All modes (FM optional), band spread, ANL. | $229.00 |
| Cat D-2801 | Drake SSR-1 receiver. 550kHz-30MHz, Wadley Loop. 5kHz dial accuracy, 3 way power. | $300.00 |
| Cat D-4701 | RAK listener 1 'V' antenna. 3 – 30MHz, with trap. Comp. assembled. Ideal for DX work. | $18.75 |
| Cat D-4703 | RAK Listener 3. Long wire dipole, supplied with balun & all accessories, 3 – 30MHz. Ultimate! | $42.50 |

## ACCESSORIES

| | | |
|---|---|---|
| Cat D-7104 | Hi-mound morse key. Double ball pivot rollers and adj spring. Contacts for break-in keying. | $19.75 |
| Cat Q-1340 | Osker Bloc SWR200 SWR & power meter. 3–30MHz, Pwr 0–2kW; SWR 1:1 – infinity. | $57.50 |
| Cat Q-1360 | FS5 SWR/power meter. 3 – 30MHz, dual imp. Pwr 0–100W; SWR 1:1 – 1:3. | $29.50 |
| Cat D-5310 | RAK BL50A balun, 52 ohms unbal/52 ohms bal. T shape, use as centre support for dipoles. | $17.40 |
| Cat D-4508 | TOO7 Antenna quick release (mobile) Take the antenna off to avoid vandalism & damage. | $6.75 |
| Cat D-2875 | SS727 Slow Scan TV. Receives both SSTV & ordinary TV. 240V AC operated. | $598.00 |
| Cat D-5204 | Apollo 3 position co-axial switch. Low insert. loss, standard PL259 connectors. | $18.50 |

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FULL PAGE ADVERT
'AMATEUR RADIO' DECEMBER 1976

"formal" tuning conditions. However, there are the "Haaaarloooow" tuners, and I am one of them, that try to simulate an average voice for long enough to observe the nearly static pattern on the 'scope and make appropriate adjustments to exciter load and tune, linear load and tune, and mike gain. Not very satisfactory, and not very polite either!

Some wit on air considered that I should build an electronic "AAR" (read "Ah") generator. It would say "Ah" as long as the batteries lasted, and would give a static approximation of a voice waveform for long enough to allow for considerable experiment. So I plugged a mike into the rig and observed that without compression and processing, my voice averaged the oscillogram of fig 1, when viewed at the antenna. The repetition rate was about 100 Hz, in a rough triangle form. Such a waveform would be quite easy to generate. A tone of about 1 kHz modulated by a triangle wave would yield the required waveform as shown in fig 2. Modification of the 100 Hz triangle wave would tailor the generator to any particular voice.

So there we are, a waveform that will allow the operator to set his output controls so that the output is at a maximum with a waveform at the output that can be made as similar to the input as he likes.

Note that if the envelope frequency is too close to the modulating frequency, unwanted outputs will be developed that will change the character of the wave.

All the same the method is useable. However, there are still problems in interpreting the output wave form. The shape has still to be compared with a picture of the original, in much the same way that a 2-tone output has to be judged. Whilst gross distortion is obvious, small deviations from the ideal are not so evident.

At this stage I borrowed a page from the testing methods used in television circuits. One very effective method of measuring linearity in television is to measure the height of successive steps in a staircase waveform. In particular, a modulated staircase is used to examine the performance of a video link at the colour subcarrier frequency. So why not a version at audio frequencies? The height of successive steps could be examined at the output of the transmitter, and the effect of *each* control in the system can be examined in turn. It is very obvious when the top step begins to crush, and it is very obvious when the transmitter output, on the top step, is at a maximum.

The advantages of using a test signal of this type are beginning to mount. The waveform is fairly similar to that of a voice, deviations from good linearity are fairly obvious, and the testng power level is at 25% of the PEP value. At this level there is little danger of anything overheating if the system is fairly well tuned.

The generator that I built is described here.

The staircase repetition rate and the modulating frequency were not more than an educated guess, 33 and 1700 Hz being chosen so as to have 10 cycles of audio on each step of 5 steps. 1700 Hz was chosen as being somewhat on the high side of the middle of the audio band of most transmitters. The block diagram of fig 3 shows the principle of operation. The non-symetrical square wave 170 Hz oscillator "A" is counted by the modulo-5 counter "B" whose outputs are weighted into a low resistance by network "C" to give the staircase as shown. This signal is used to modulate the output of the 1700 Hz oscillator "D" in the balanced modulator "E". The output of the modulator is put through a very simple RC low-pass filter "F" to produce the required waveform.

The detailed circuit diagram is shown in fig 4 and is quite straight forward. A total of 4 integrated circuits are used, TTL for the oscillators and counter, and the general purpose C 1496 for the modulator. It all fits on a piece of mattrix board, 10 by 5 cm. The 4 controls are set as follows: RV 1, 2, 3 are set to obtain as close to even steps as possible at the input to the modulator, with a total amplitude of 150 mV. It will not be possible with this circuit to obtain exactly even steps, but the available result is quite acceptable.

RV4 is set to obtain +6 volts on pin 6 of the MC1496. A slight adjustment of RV4 may be necessary to obtain a symmetrical output when viewed on an oscilloscope. It might also be necessary to readjust RV1, 2, 3 to obtain equal steps in the modulated steps. The output of the prototype had a peak to peak amplitude on the top step of 1 volt. The power was provided from a -9, 0, +9 volt supply. A couple of 5.1 volt Zener diodes provided regulated rails for the TTL chips and the reference potential. Make sure that the 1700 Hz modulating frequency is within the audio range of the transmitter, as a 4 kHz signal for example just won't get through most filters used in sideband service.

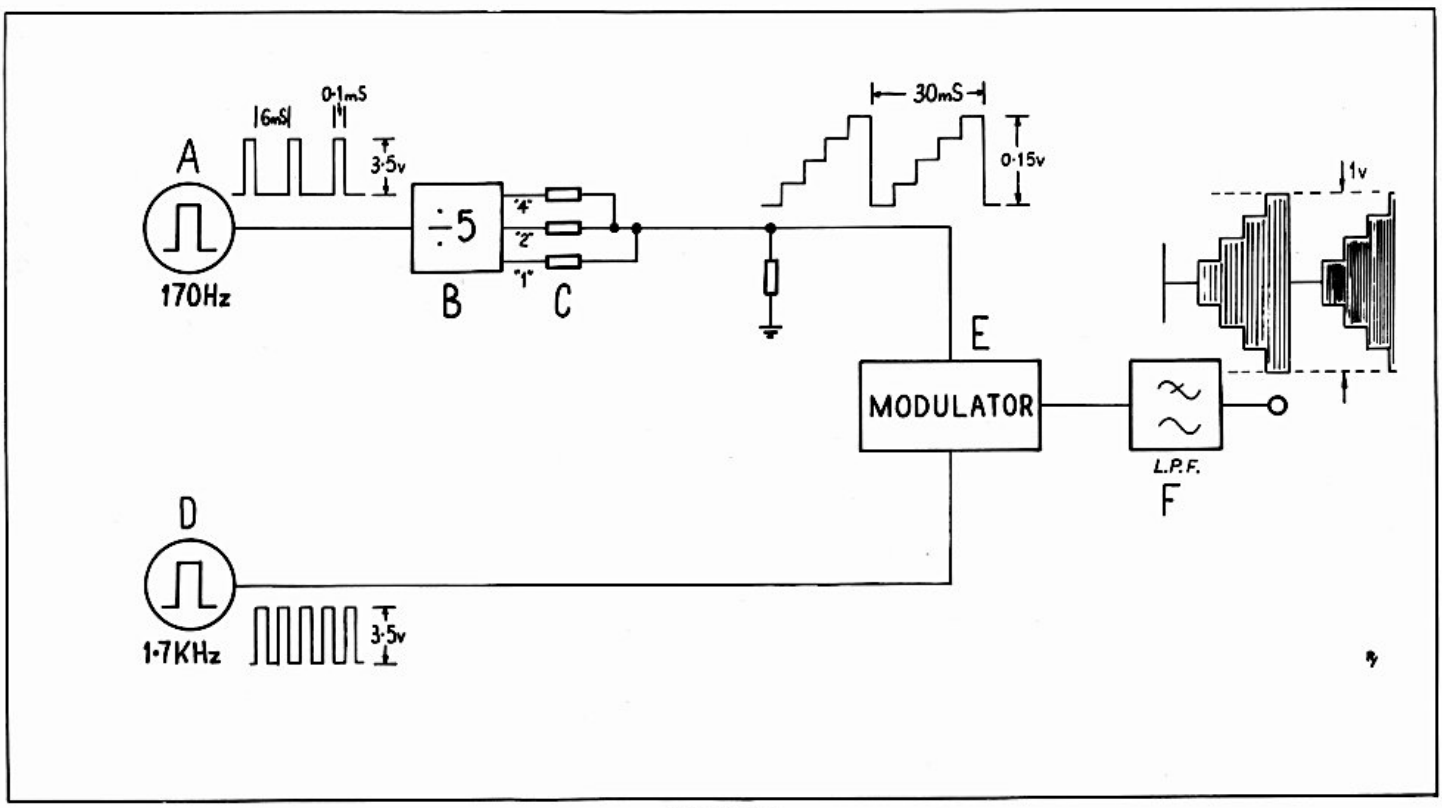


**FIGURE 3**

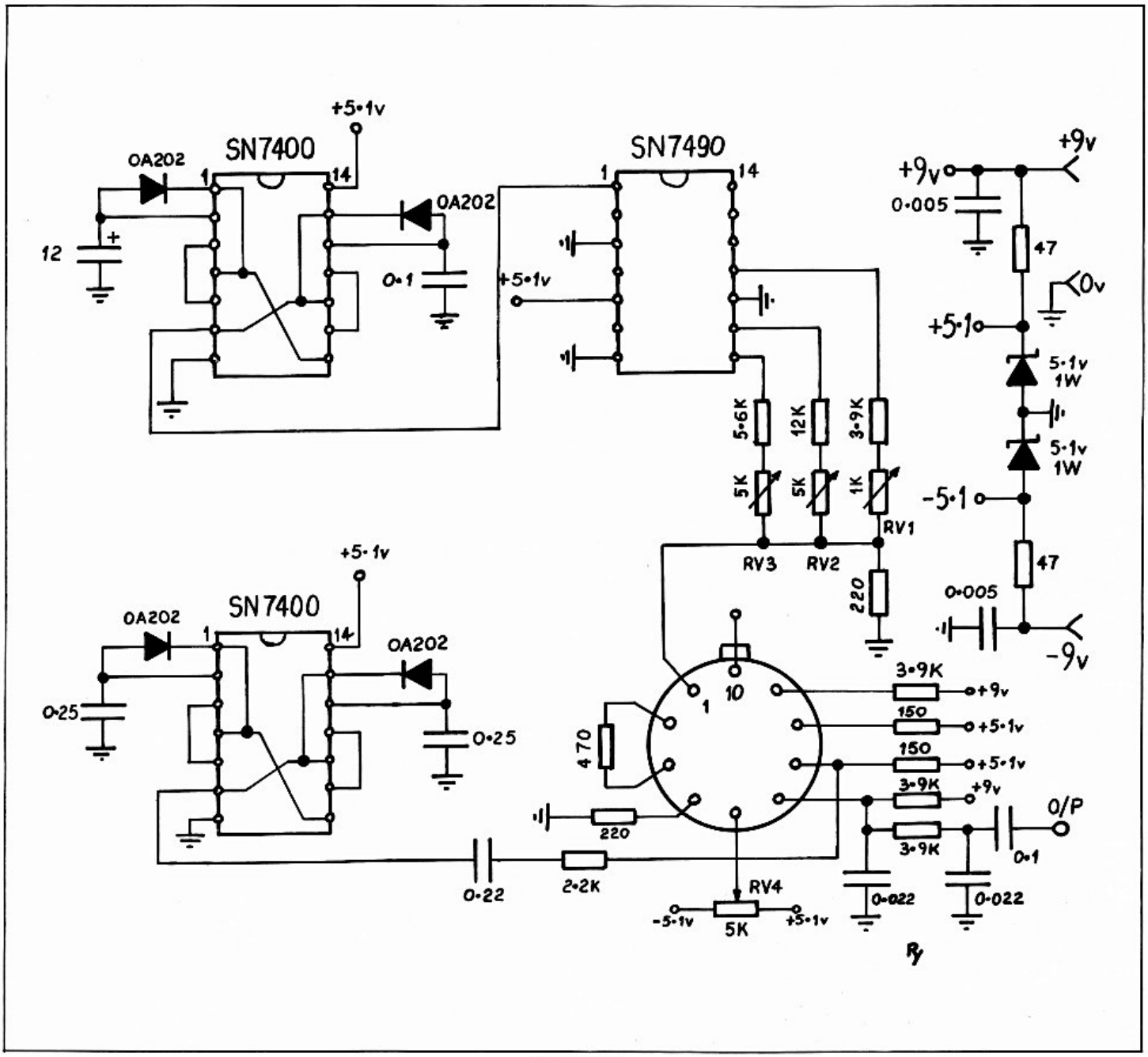


**FIGURE 4**

My transceiver uses a tip-ring-sleeve type of mike connector, so I fitted such a plug to the generator, with the tip connected to earth so that the Tx is operated whenever the unit is plugged in.

The circuit of fig 4 was theoretically derived, and when I put it together, it worked much as I expected and further development was not necessary. Thus there may well be some details that could be further developed or varied to suit individual tastes.

In use, without speech processing, the oscillogram at the output of the transmitter will be similar to that at the mike input, but only if the system is linear. The 1700 Hz modulation will of course appear as 14 MHz odd on the 20 metre band for example. Inadequate filtering at the output of the generator results in a small amount of ripple on each step, although it is not a nuisance. So, set the load and tune controls for maximum amplitude top step, with even steps at the same time, setting the mike again so as not to cause overload. If you use an in-line power meter, note the reading and multiply by 4 to obtain the PEP output on equivalent voice peaks. You may well get a surprise when you compare it with the result of a 2-tone test. The chances are that the PEP output on equivalent voice peaks is higher than the 2-tone PEP by 20 to 40% since the average system loading on power supplies is lower. Unplug the stair-step and plug in a mike, and adjust the mike gain for voice peaks of about the same level as the level on the top step as viewed on the 'scope, and you will have an optimised signal that is one of the cleaner signals on the band.

The use of the generator does not end here. It may be used to observe the operation of speech processors, which, after all only modify the linearity of the system in an ordered way without overloading the system, hopefully. A linearity fault in a system may be examined by observing the linearity at intermediate points with the aid of a suitable probe. At VK3AAR, this unit has certainly replaced the 2-tone generator, and may well disappear inside the exciter to operate in the "tune" position. ■

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# TELETYPE MESSAGE AND KEYBOARD GENERATORS

H. G. Kociemski VK4ZAP
61 Spring Street, West End,
Brisbane, Qld., 4101

**Expensive and complex mechanical GONKULATORS are now defunct, or nearly so. This design was originally intended to replace the transmit section of the mechanical teleprinter, and indeed it could do so if a keyboard was installed at the input to the code converter. However, problems may be encountered with contact bounce.**

## MESSAGE GENERATOR:

Basically, the device is a 5 unit code generator which can generate a sequential message e.g. "VK F/S 2 L/S ZHK SPACE TEST C/R L/F" and repeat, in standard teletype form complete with start and stop pulses.

The output of the device is standard TTL logic and can be used to drive an FSK or AFSK transmitter, though this has not been tried yet.

The unit functions very well, giving virtually zero distortion 20 mS pulses (variable) in serial form. Commercial practice dictated the use of 30 mS stop pulses. The stop pulses here are 20 mS (due to ease of design), however, it will generally be agreed that this is inconsequential.

I have tested the device on OTCs standard mechanical 50 and 75 baud teleprinters via a mercury wetted polarized relay and double current to single current converter.

Operation starts at the Automatic Sequence Generator which is driven by a (variable speed) clock. This sets the rate at which letters are printed.

The binary counter sequentially addresses the 1 of 16 decoder causing a sequential logic zero on each of the output lines. Hence the output of the transistors driver goes high and forward biases the respective diode encoder.

Hence the 5 unit code is generated in parallel form, and is displayed on the LEDs.

The 5 input NOR gate senses the presence of the 5 unit code and triggers the monostable multivibrator which "loads" the shift register within 3 microseconds. When the monostable returns high, the shift register is already loaded and immediately clocks the data, including the fixed start and stop bits, out to line.

The serial data is now a 7 unit code and could be used to drive a teleprinter

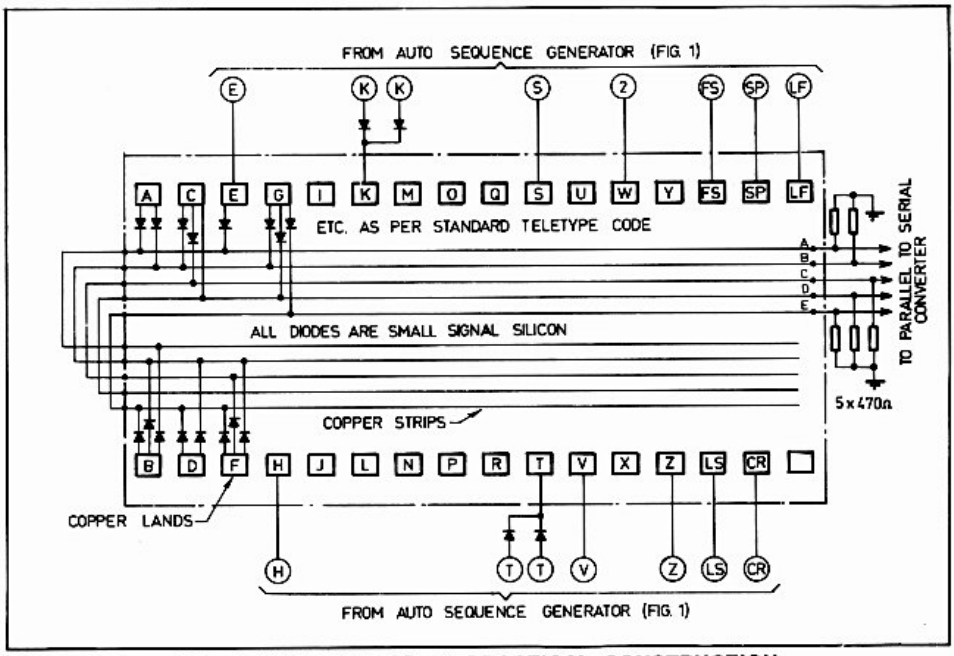


**FIG. 1. DIODE ENCODER, PRACTICAL CONSTRUCTION**

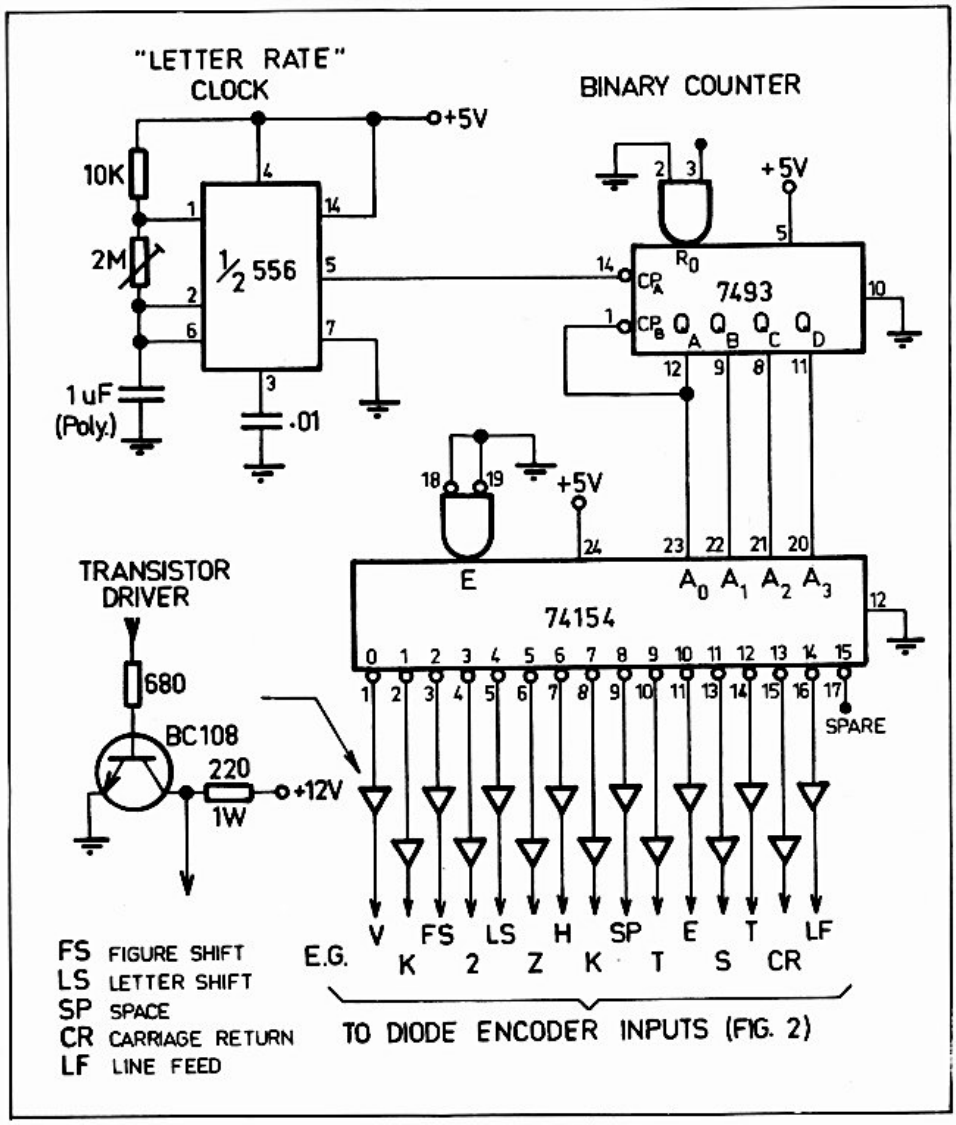


**FIG. 2. AUTOMATIC SEQUENCE GENERATOR**

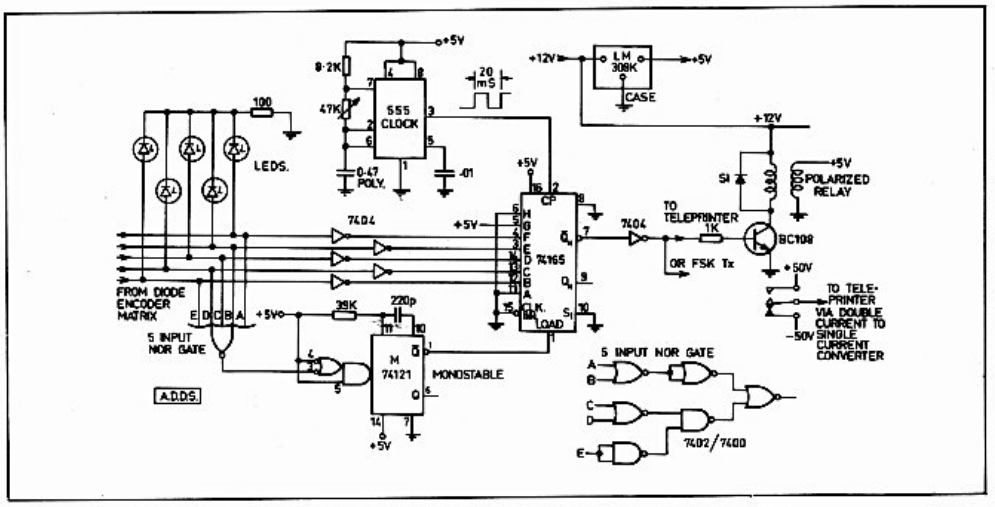


**FIG. 3. 5 UNIT CODE PARALLEL TO SERIAL CONVERTER**

via the interface shown, or it could modulate an FSK or Audio FSK TX.

Construction is non-critical with regard to layout due to the relatively slow speed — a legacy of mechanical days gone by. The device was built on Veroboard using readily available and cheap TTL ICs.

The beauty of it lies in easy programmability. Any message of up to 14 letters plus line feed and carriage return can be generated. A method of extending to 32 lines might be to use relays to switch the 16 output lines of the sequence generator to another 16 inputs on the diode matrix every time the counter recycled.

A possible application would be to replace the "answer back" code wheel in mechanical teleprinters or as a "quick brown foxes . . ." or "RY, RY, RY . . ." generator (with extended binary counter/decoder circuitry). On the other hand it does make an interesting conversation piece!

When typing blindly into a transmitter with an electronic RTTY generator, or when typing into an FRXD (typing reperforator), which is what I use for the receive leg or local loop, it is very difficult to determine where to place the "carriage return" signal so that the receiving page printer will not print a great "blob" at the end of the line or return prematurely to the start of the page. Some FRXDs have an ingenious gear which rings a bell when the end of the line is reached.

The "carriage return" indicator presented here (fig 6) is composed of 2 counters in series (capable of counting to 256) but only counting to 70. 72 characters is the maximum per line, so when the alarm switches on at 70 there is a warning that the end of the line is approaching.

The first counter is fed from the output of monostable 2 in a previous circuit and counts every time a key is pressed. The counter outputs are wired so that count 70 is detected and drives an alarm circuit.

The counters need to be cleared to zero for the next line, and this is done by a detector circuit which responds to a "carriage return' 'signal and changes the state of the reset line. The alarm switches off and all is ready for the next line of characters.

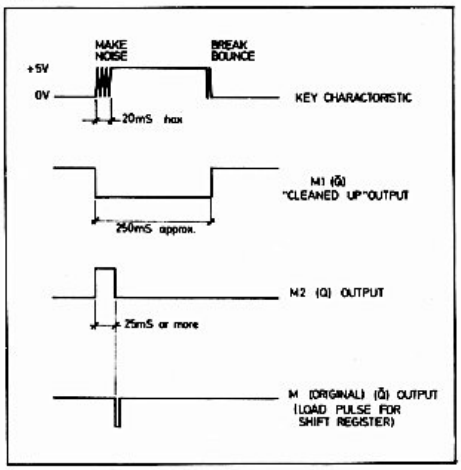


**FIG. 4**

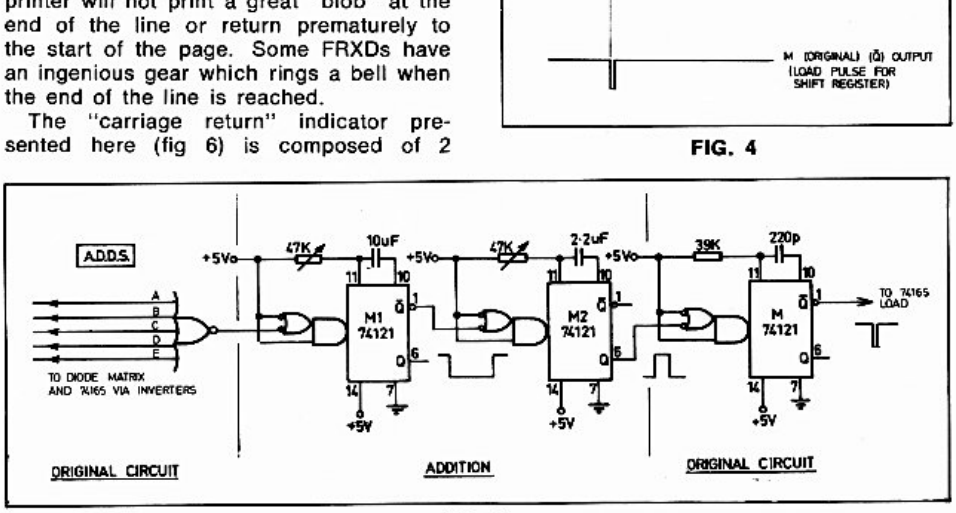


**FIG. 5**

# MAKE IT ON 70 cm FROM YOUR MOBILE OR HOME STATION, 2m RIG

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**Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation.**

FEATURES: High quality double-sided glass fibre printed board ★ Highly stable zener controlled oscillator stages ★ PIN diode aerial changeover relay with less than 0.2 dB through loss ★ Extremely low noise receive converter, typical 3 dB ★ Separate receive converter output gives independent receiver facility ★ Built in Automatic RF VOX with override facility ★ Built in 10 watt 144 MHz termination, selectable attenuator for ½ watt ★ Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output. Limited supply only availavle ex stock, further units currently on order for expected early delivery.

**Model MMT432/144 — Price $235, pack and post $2**

## TRANSVERTER MODEL MMT432/28

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**MODEL MMT432 — Price $195** add pack and post $2.


**MMT TRANSVERTER**

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This 144 MHz Solid State Linear Transverter is intended for use with 28 MHz transceiver to produce a highly reliable transceive capability for satellite or terrestrial communication ★ Power output 10W min. ★ 28 MHz drive ★ IF at 500 mW or 5 mW ★ Receiver gain and noise, typical 30 dB and 2.5 dB ★ Internal Antenna changeover ★ Case size 187 x 120 x 53 cm ★ Power requirements 11 to 13V at 300 mA to 2.2 amp. peak ★ Spare 144 MHz input socket.

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Overall gain 25 dB. **Price: $58.**

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Overall gain: typ. 30 dB.
IF: 28-30 MHz or 144-146 MHz 9-15 V 30 mA. **Price: $45.**

**144 MHz MOSFET CONVERTER**
Noise figure: typ. 2.8 dB.
Overall gain: typ. 30 dB.
IF: 28-30 MHz, 9-15 V 20 mA.
**Price: $39.**

**VARACTOR TRIPLER 432/1296 MHz**
Max. input at 432 MHz: 24 W (FM, CW) - 12 W (AM).
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The double NOT is necessary to keep the input of the 7430 from floating to a 1. (This input was originally tied directly to line 4 and caused a permanent 1 there).

The 4.7 uF capacitor was used to remove very fast transient pulses which tended to interfere with counter operation when certain keys were pressed.

(Note: Each counter should have a bypass capacitor *at the supply pins* for best results. The popular 7490 decade counter could also be used with similar decoding. Tech Ed.).

**KEYBOARD GENERATOR:**

As a companion to the RTTY message generator, this keyboard would make a valuable addition to the shack.

Further development of the Message Generator has produced a complete solid state teleprinter transmit unit, thanks to the recent availability of a good quality, low cost keyboard from Melbourne.

2 ICs and associated components are required to transform the original "fixed message" generator to a keyboard unit.

The big problem was elimination of false triggering due to contact noise and bounce in the keyboard.

Monostable M1 and M2, take care of this as can be seen from Fig 4. The monostables, as wired, only triggers on negative going edges.

With this simple but effective system, a criterion must be observed for correct code generation. The typing action must be observed for correct code generation. The typing action must be carried out within the period of operation of monostable M1 i.e. less than 250 mS approximately (normal typing action), otherwise a false trigger will occur, producing an "all spaces" condition.

Even though the circuit has been modified, the fixed message facility still performs perfectly, and that part of the circuit is built on a plug-in board so that it is quite easy to change from keyboard to fixed message.

**FOOTNOTE**

The circuits shown here could probably be simplified somewhat to reduce component count and power consumption, but obviously works "as is".

**Technical Editor** ■

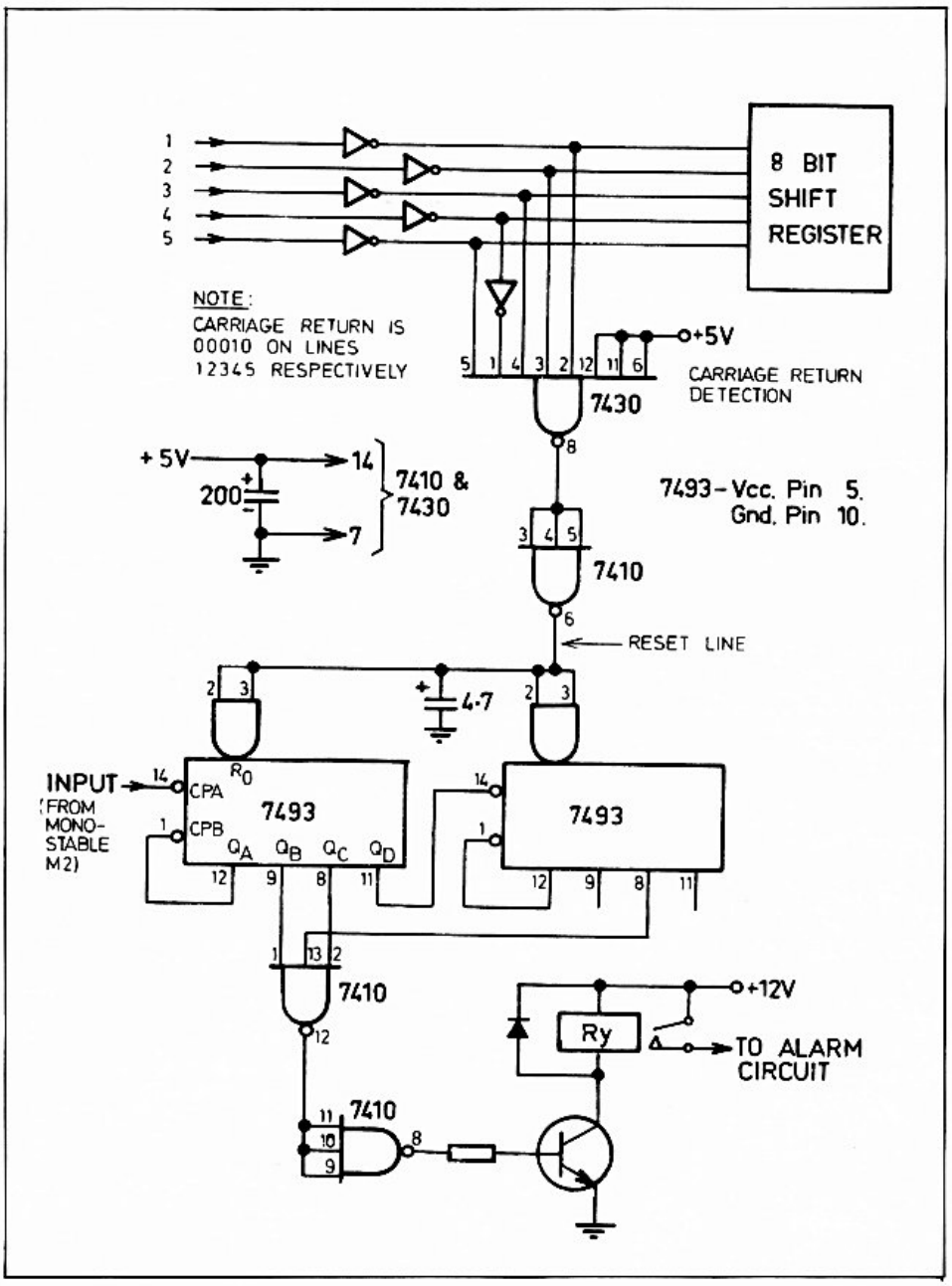


**FIG. 6. CARRIAGE RETURN ALARM CIRCUIT.**

# A PERSONAL VIEW OF THE METRE WAVE SCENE IN THE U.K. NOW

By Jack Hum, G5UM*

*(RSGB VHF Awards Manager, member of RSGB VHF Committee, conductor of "Four Metres and Down" column in **Radio Communication** from 1966 to 1974, member RSGB Council 1952-59, and a Vice President of RSGB).

**Any expatriate amateur radio operator returning to his native UK after a few years in, say, VK or ZL would hardly believe his ears as he sampled the 2m or the 432 MHz bands today.**

Very much a thing of the past, he would find, is the old geographical band planning he knew so well. Very much a thing of the present in its place is band planning by mode. Old familiar beacon signals appear in new places on the dial. And new unfamiliar repeater signals are now to be heard popping up almost 24 hours a day.

Putting his sensations into one sentence, he would probably conclude that metre wave development in Britain was proceeding at a dynamic rate unsurpassed in any other area of amateur radio activity. He would be right, even if he looked at no more than the already mentioned 144 MHz and 70 cm bands. He would be even more right if he took account of the rest of them from 70 MHz right up to 24 GHz.

It has not always been so. In the fifties it seemed as though the metre wave scene in the U.K. was frozen into the pattern it took up immediately after the war, when crystal controlled converters into main station receivers as IF strips, and simple amplitude modulated transmitters were the norm. The 2 m and 70 cm bands were subdivided by voluntary arrangement into

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zones related to frequency; if you wanted to work a station in Scotland or the north of England you turned your beam antenna that way and tuned only a restricted portion of the band in which Scottish and northern stations congregated. This obviated the chore of having to tune the whole of 144-146 or 432-434 MHz, which are the British communication allocations.

First indications that this pattern was to be unfrozen came when the F3 frequency modulation mode gathered some strength, followed later by the appearance of single sideband. At first these modes were regarded as disturbing to the ordered staticness of the 2 m and 70 cm bands to the extent that they were confined to spot frequencies, 144.48 MHz for FM and 145.41 for estoeric A3J, the sport of kings, electronic kings at least and outside the competence of the drill-and-hacksaw kitchen table enthusiast who delighted in making things work for himself but not anything quite so fraught and frightening as single sideband at VHF.

Today it seems unbelievable that such a state of affairs existed little more than half a dozen years back. Frequency modulation is now the standard mode of voice communication not only in Britain but in VHF circles in most of the European countries that make up IARU Region 1. One should qualify this statement by adding "voice communication for *local* contacts", for it is closely matched in popularity by A3J for DX working. Each is tidily compartmented, FM above 145 MHz and SSB below 144.5 MHz. The "bit in the middle" is occupied by a mixture of modes from slow scan television, local nets on FM, plus the last vestiges of amplitude modulated telephony that still remain.

The bottom 150 kHz of the British 4 m, 2 m and 70 cm bands is reserved for CW, still the best-ever mode for guaranteeing a sustained contact when all else fails and when even SSB, reading nil on the S-meter, at last peters out. To some, telegraphy remains the last bastion of true amateur radio, a romantic notion not shared by many; yet the fact remains that it is the last bastion of something else, and that is the ability to demonstrate operating skill. Where no skill is called for to actuate a press-to-talk button on a phone transmitter, a good deal of expertise is needed to talk through the finger tips via a morse key, making it up in the head as you go along to emerge in the brain of the person at the other end as pure conversation, impeccably phrased and spelt.

**COMMUNICATION BY PROXY**

From this image of direct communication via the A1 mode nothing could be in greater contrast, aver many VHF operators, than the concept of communication via repeater. Since the advent five years ago of the pioneer 145 MHz repeater developed by the radio amateurs at the Pye establishment and installed a dozen miles south of the city of Cambridge, repeaters have proliferated throughout the British Isles to an extent that saturation point has virtually been reached in respect of co-channelled VHF repeaters spaced at 100-mile intervals, and interest is now being turned on the development of a parallel chain on 70 cm. The 2 m chain has 600 kHz spacing between input and output frequencies, the 70 cm chain 1600 kHz.

Two primary causes of this burgeoning of the repeater ethic are, first the enormous increase in mobile operation in the U.K., where one fifth of the 20,000 amateur licensees also hold "Stroke mobile" permits (and most of them use VHF); and secondly the widespread availability of ex-taxi transceivers readily adaptable to the amateur bands, and of Japanese "black boxes" that all too readily earn their owners the appellation of "appliance operators" with not the slightest effect on the huge sale of such devices.

Few developments on the metre wave scene in the U.K. have been so controversial as the repeater one. Extreme positions are taken up, expressed in such statements as "This isn't real amateur radio" to, on the other hand, "This repeater business is the ultimate in ease of communication". Both are right — up to a point! What is incontrovertible is the fact that repeaters have immensely extended the range of vehicle to vehicle equipments and probably made such communication safer than it was in the simplex days of one hand on the steering wheel and the other on the rig. And anyway, as one correspondent to the RSGB's *Radio Communication* remarked "If you don't like repeaters you don't have to use them. Metre waves represent a house of many mansions, and if you don't like one door try another".

**MANY MANSIONS**

A look now through some of those *other doors*. One of them is labelled *70 MHz;* it is the nearest thing to the American 6 m band which the British possess, and is peculiar to the U.K. Strangely, it is denied to the Class B licensees with their G8-plus-3 call signs and no morse requirement. This at once reduces its population to those full-licence owners who find it a fascinating band capable of yielding DX well beyond the range to be expected on 2 m. But it is, one must confess, a minority interest.

So also are the microwaves. But here, as with 4 m, amateur curiosity impels exploration, helped along by the opportunity to earn special operating awards which the RSGB offer for long distance coverage on such bands either from home locations or from contest operation. Particularly on the microwaves, no "frozen into accepted patterns" is evident: antenna dishes once *de rigeur* become supplanted by Yagis, klystrons by Gunn diodes (or vice versa!)

Of other mansions, such as Oscar or high definition television, space prevents one from doing more than to record that they exist, enjoy an enthusiastic minority following and are productive of some surprising results.

**HANDS ON TILLERS**

Lest it be thought that all this dynamic activity is random, self-generating or spontaneous, one had better emphasise that most of it is inspired, directed and generally assisted by the national society, the RSGB, operating through such bodies as the VHF Committee, the VHF Contest Committee, the Repeater Working Group and similar voluntary bodies that skilfully hold tillers on to true courses where in their absence there might well be some wild — perhaps dangerous — navigation.

For example, all beacons are an RSGB responsibility. So are the repeaters. The licences for all of them are vested in the RSGB by the UK amateur licensing authority.

Internationally, the RSGB works in close co-operation with sister societies on the mainland of Europe, or what is known as IARU Region 1, mentioned earlier. The dates and rules of metre wave contests are harmonised in this way. Farther ahead lies the watershed of the 1979 World Telecommunications Conference, and the hard look it will doubtless give to amateur frequency allocations. Preparations to surmount it are well advanced in RSGB, and the metre wave content of those preparations is a very sizeable one. ■

# THE FACE BEHIND THE MICROPHONE

Pictured is Graham Clements VK3TK.

Graham is currently the chairman of the VK3 division broadcast committee.

He first became interested in radio at the age of 12 when he began SWLing to commercial stations. He joined YRCS when he was 14 and progressed to senior level in approximately 18 months.

His limited licence (VK3ZLT) was obtained in 1972 and he became active mostly on 2MX FM and AM. In mid 1973 he joined the Broadcast committee, and obtained his full call in 1974.

He has been active on 40 and 20 DXing, and has now branched out to ATV which he thoroughly recommends to anyone who is looking for something extra-exciting.

Graham is presently studying for a degree in Communications Engineering (3rd year) at RMIT.

We wish him well in his ventures.

# INDEX TO VOLUME 44

## JANUARY-DECEMBER 1976



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**FT-301S • FT-301 • FT-301D** include rejection tuning on Rx.

**FP-301 MATCHING POWER SUPPLY.** 20 Amp 12V suit all 301 Tranceivers. **$148.**

**FP-301D DELUXE POWER SUPPLY.** With built in 24 hr on 12 Hour Clock and auto — CW ident Keyer. **$TBA.**

**YO-301 MATCHING MONITORSCOPE** for FF-301 Series. **$TBA**

**FT-200 TRANSCEIVER:** 80-10 Mx, PA two x 6JS6C, 260W peak input SSB. Manual, PTT or VOX control, offset tuning, calibrator. Operates from a separate power supply. **FP-200:** Yaesu AC power supply for FT-200, in matching cabinet with built-in speaker. Power supply and transceiver. **$499.**

**FL-101 TRANSMITTER:** Solid state 160-10m, PA two 6JS6C, all facilities. Companion unit to FR-101. **$566.**

**FL-101 SPEECH PROCESSOR:** For installation in the FL-101. **$69.**

**FRG-7 WADLEY LOOP RECEIVER:** All solid state, 0.5-29.9 MHz in thirty 1MHz bands. Electronic band selection. **$279.**

**FR-101D RECEIVER:** All solid state, 23 bands inc. all amateur bands 160-10m plus 6 and 2m, FM, CW, etc., etc. **$759.**

**FT-101D DIGITAL:** Has all the options of the FR-101D as well as DIGITAL READOUT. **$933.**

**FR-160 FIXED CHANNEL MARINE and AMATEUR RECEIVER:** 12ch. (6ch. AM, 6ch. SSB.) 1.6-4.5 MHz SSB/AM. 240V AC, 12V DC, built-in spkr. **$249** plus Crystals.

**FL-110 SOLID STATE LINEAR AMPLIFIER.** 10-15W drive, 200W PEP Input, 160-10mx. **$194.**

**FL-2100B LINEAR AMPLIFIER:** 80-10Mx, uses 2x572B triodes in G.G., twin fan cooled, styled to match FT-101E. **$455.**

**FT-620B SIX METRE SSB AM, CW, TRANSCEIVER:** 10W solid state, inc. calibrator and AM filter. **$498.**

**FT-221R TWO METRE TRANSCEIVER:** Features all mode operation — SSB/FM/CW/AM — with repeater offset capability. 144-148 MHz coverage using advanced phase-locked loop circuitry. **$569.**

**M-620/221 MOBILE MOUNT** for FT-620B and FT-221. **$29.**

**QTR-24 — 24 HOUR WORLD CLOCK:** At a glance the time anywhere in the world can be read. **$29.**

**FP-2 AC POWER SUPPLY** suitable for use with FT-223, etc. 240V AC in, 12V DC 2A out, with built-in speaker and charger. **$89.**

**FTV-650B SIX METRE TRANSVERTER:** Converts 28 MHz. SSB to VHF, and includes receiving converter. 50W PEP. Primarily designed for coupling with Yaesu transmitters and transceivers. **$215.**

**FTV-250 TWO METRE TRANSVERTER:** Similar FTV-650B. 10W-15W output, but all solid state and built-in AC PS. **$246.**

**FT-223 TWO METRE TRANSCEIVER:** 10W, 23 Channels, plus one priority channel, direct frequency readout. Includes 40, 50 & 51, plus one rptr. (Other rptrs. available at $9.00 per ch.). **$199.**

**YC-500E 500MHz FREQ. COUNTER:** Accurate to .02ppm. **$495.**

**YC-500S 500MHz FREQ. COUNTER:** Accurate to 1 ppm. **$385.**

**YC-500J 500MHz FREQ. COUNTER:** Accurate to 10 ppm. **$289.**

**YO-100 MONITORSCOPE:** Matches the FT-101E, but can be used with other Yaesu equipment. (IF kits 455 kHz and 9 MHz optional extra). **$222**

**YP-150 DUMMY LOAD/POWER METER:** For use over the frequency range 1.8-200 MHz. Three power ranges, 0-6W, 0-30W, 0-150W with built-in cooling fan. **$88.50**

**FF-50DX 3-SECTION LOW PASS FILTER** for TVI reduction. **$32.50.**

**F-101 FAN. $35.**

**SP-101 MATCHING EXTERNAL SPEAKERS** for FT-101, FR-101, FRG-7. **$42.50.**

**OPTIONAL CRYSTAL FILTERS.** (Inc. CW & AM filters for FT-101). **$55.**

**MATCHING VFOs:** FV-101B, FV-200, each. **$120,** FV-301 **$130.**

**YC-601 DIGITAL READOUT ADAPTOR** for FT-101E, inc. built-in AC PS. **$208.50.**

**YD-844 DESK MICROPHONE:** Yaesu De Luxe PTT Dynamic type with stand, spring and lock PTT switches. PTT also actuated when lifted from deck. **$43.50.**

**RS SERIES HF GUTTER MOUNT MOBILE ANTENNAS:** RS Base and Mast (doubles as ¼ wave on 2m). **$19.50.** Coil and Tip Rods: RSL-3.5, **$17.50.** RSL-7, **$16.50.** RSL-14, **$15.50.** RSL21, **$14.50.** RSL-27/28, **$14.**

**As the sole authorised Yaesu agent and factory representative for Australia, we provide presales checking of sets, after-sales services, spares availability and 90-day warranty.**

Quote type and serial number of set when ordering spares. All prices include sales tax. Freight is extra. Prices and specifications subject to change without notice. Allow 50c per $100 for insurance.

# LARGE RANGE OF ACCESSOR

YAESU

SAHI ANTENNA

HIDAKA

Cush Craft

## STANDARD VHF and UHF TRANSCEIVERS

| | |
|---|---|
| SR-C146A, 2m hand held 5 chan. 2W transceiver, inc. carrying case and 4chns | $175.00 |
| SR-C432A, 70cm hand held 6 chan. 2W transceiver, inc. carrying case and 1 chn (435 MHz) | $229.00 |
| SR-C430 70cm 12 chan. 10 watt mobile transceiver inc. 1 ch (435 MHz) | $295.00 |

### STANDARD ACCESSORIES

| | |
|---|---|
| CMP08 Hand mic. for SR-C146A and SR-C432 | $ 21.50 |
| CAT08 Rubber antenna (helical) for SR-C146A | $ 9.00 |
| Heavy Duty Carrying Case for hand held units | $ 14.50 |
| AC Adapter and charger for hand held units | $ 39.00 |
| Mobile Adapter for hand held units | $ 12.50 |
| AC Charger only | $ 10.00 |
| Ni-CAD Penlight Cells, type AA | $1.90 |

### MONITOR RECEIVERS

| | |
|---|---|
| **SC101,** Automatic scanning receiver, 4 VHF chns., 4 UHF chns., Xtals extra. | $147.00 |
| **MR-2,** Mini Monitor. 12 ch. pocket receiver VHF. | $118.58 |
| **MS-2,** Mini Scanning Receiver 4 Ch, inc. | $160.65 |

### MARINE NOVICE/11 METRE TRANSCEIVERS

| | |
|---|---|
| GTX-3325, SSB/AM 23 Ch. Inc. N.B. | $219 |
| CB-555 AM 23 Ch. Transceiver Inc. N.B. | $119 |
| CBR-9000 6 Ch. In-dash mount. B.C. 2 FM. | $159. |
| 606CB 23 Ch. AM/BC/FM MPx/Cassette stereo In-dash mount transceiver | $272.00 |


## ANTENNAS AND ANTENNA ACCESSORIES

### HF MONOBANDERS

| | |
|---|---|
| 204BA, 4 element 20m. Beam | $219.00 |
| 203BA, 3 element 20m. Beam | $185.00 |
| VS-20CL 3 elem. W.S. 20m beam, **inc. Balun** | $169.00 |

### HF DUO BAND

| | |
|---|---|
| VS-22 3 element 15-11/10m, **inc. Balun** | $128.00 |

### HF TRIBAND BEAMS

| | |
|---|---|
| TH6DXX, 6-element trap Beam | $275.00 |
| TH3Mk3, 3-element trap Beam | $231.00 |
| TH3Jr, 3-element trap Beam | $167.00 |
| HY-QUAD 2 element Quad Beam | $252.00 |
| VS-33 (Equiv. TH3Mk3), **inc. Balun** | $196.00 |

### NOVICE BEAMS

| | |
|---|---|
| CB-3 3-element 11m | $59.95 |
| CB-5 5-element 11m | $75.00 |
| Long John 5-element (wide spaced) 11m | $106.00 |
| Eliminator II, 2-element Quad. Sw'ble polarisation, 11m | $99.00 |
| Big Gun II, 4-element Quad. Sw'ble polarisation, 11m | $199.00 |
| SDB-6 Stacked 6-el Beam (3 + 3) | $141.00 |

### HF VERTICALS

| | |
|---|---|
| VS41/80KR 10m thru 80m, inc. 11m | $88.00 |
| VS-RG Radial Kit for VS-41/80 KR | $25.00 |
| 18AVT, 10m thru 80m trap Vertical | $108.00 |
| 12AVQ, 10m thru 20m trap Vertical | $55.00 |
| 18V 10m thru 80m base loaded Vertical | $43.00 |
| 18HT 10m thru 80m Tower | $299.00 |
| CLR-2⅝ wave, 11m G.P. | $53.00 |
| GPGP ¼ wave, 1m G.P. | $26.50 |
| Silver Rod ½ wave, 11m 3.75 dB | $39.95 |
| CR-1 ½ wave Ringo, 11m 3.75 dB | $47.00 |
| HOPE-10GP. 10/11 metre helical groundplane | $70.00 |
| Million V1 11 metre ½ wave 3.75dB | $37.00 |

### HF MOBILE WHIPS AND FITTINGS

| | |
|---|---|
| HELL CAT 3 35'' Magnetic base, 11m | $36.00 |
| AQUA CAT 108'' Marine, 11m (no ground plane req'd.) | $76.00 |
| HELL CAT 9, 58'' Marine (no ground plane req'd.) 11m. | $40.00 |
| W-102 102'' S.S. Whip | $17.00 |
| HOPE-10R 10/11 metre adjustable gutter mounted helical inc. cable and connector | $42.00 |
| HOPE-10B 10/11 metre adjustable helical equipped with ball mount and spring | $38.50 |
| THUNDERSTICK 108'' fibreglass whip | $21.00 |
| SUPER STICK similar to Thunder Stick, but double section | $23.00 |
| GUTTER CLIP for whip tops | $2.50 |
| HOPE-15R 15 metre adjustable gutter mounted helical incl. co-ax and connector | $43.00 |
| HOPE-IORE 10/11 metre whip top only (as used in Hope-10R) | $26.00 |
| HOPE-15RE 15 metre whip top only (as used in HOPE-15R) | $28.00 |
| CIT-1H 10/11 metre base loaded, boot or rooftop mount, incl. co-ax and plug | $22.00 |
| CIT-2H 10/11 metre centre loaded gutter mounted whip, incl. co-ax and plug | $22.00 |
| AS-303 HF Mobile antenna set, centre loaded, incl. heavy duty ball mount and spring | $118.00 |
| AS-NK matching SS. Bumper Mount for AS-303 | $16.00 |
| DUCK 27 MHz Replacement Ant For 11m. Walkie Talkies (12'' Flex Helical) | $8.00 |

### FITTINGS: (Suit all makes with ⅜'' x 24 thread).

| | |
|---|---|
| BPR, bumper mount | $18.00 |
| BDYF, heavy duty adjustable body mount | $19.50 |
| HWM-1, fixed body mount | $15.50 |
| SPG, heavy duty spring | 12.00 |
| SPGM, light duty miniature spring | $7.00 |
| VS-BM Ball Mount & Medium Duty Spring | $19.80 |

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# ES FROM BAIL ELECTRONICS

## SCALAR

## NTENNAS

HI-MOUND

YAESU

SR

hy-gain

### MARK MOBILE

**Helical:**

| | | | |
|---|---|---|---|
| HW-80-8 80m, 8ft. | **$47.00** | HW-15, 15m, 4ft. | **$19.80** |
| HW-80, 80m, 6ft. | **$27.50** | HW-11, 11m, 4ft. | **$19.80** |
| HW-40, 40m, 6ft. | **$25.50** | HW-11, 11m, 6ft. | **$21.00** |
| Hw-20, 20m, 6ft. | **$21.00** | HW-10, 10m, 4ft. | **$19.80** |

### VHF ANTENNAS

| | |
|---|---|
| 23, 3-element 2m Beam | **$19.80** |
| 28, 8-element 2m Beam | **$42.00** |
| 215B 15-element 2m super-beam | **$76.00** |
| VS-2GH 2m ⅝ wave ground-plane | **$28.00** |
| 64B 4-element 6m beam | **$53.00** |
| 66B 6-element 6m beam | **$87.00** |
| VS-6GH 6 metre ⅝ wave G.P. | **$30.00** |
| RX-2 three half wave 6dB gamma loop matched vertical | **$43.00** |
| ARX-450, 435-450 MHz three half wave 6dB Ringo | **$39.00** |
| AR-6, 6m ½ wave Ringo 3.75 dB | **$39.00** |
| A144-7, 7-element 2m Beam | **$28.00** |
| A144-11, 11-element 2m Beam | **$39.00** |
| A144-20T, 20-element 2m "Twist" Beam | **$79.00** |
| A50-3, 3-element 6m Beam | **$41.00** |
| A50-5, 5-element 6m Beam | **$63.00** |
| A430-11, 11-element 430 MHz Beam | **$28.00** |
| GDX-1 80-500 MHz Discone | **$68.00** |

### VHF MOBILE ANTENNAS

| | |
|---|---|
| 265 ⅝ wave Magmount for 2m, inc. co-ax | **$45.00** |
| 270 Double stacked ⅝-wave fibreglass whip for 2m | **$49.00** |
| 271 Mount for 270 | **$7.00** |
| AS-2HR, ⅝-wave SS 2m gutter mount, inc. co-ax | **$39.00** |
| AS-2P40 as above, but fibreglass whip | **$41.00** |
| AS-2HRF ⅝-wave cowl mount type | **$47.00** |
| AS-2RD 6m centre loaded SS whip with gutter mount | **$21.00** |
| VS-07MG 70cm Mag Mount ¼ wave | **$15.00** |
| AS-2DW 2 metre ¼ wave gutter mounted whip incl. co-ax and connector | **$25.30** |
| HOPE-2R 2 metre gutter mounted helical, only 22 cms long, incl. co-ax 2 connector | **$35.00** |
| VS-TOWN 2 metre flexible gutter mounted helical | **$16.50** |
| VU-2HR 2 metre Hidaka ⅝ wave gutter mount incl. co-ax and connector | **$38.50** |

### SCALAR MOBILE WHIPS

| | |
|---|---|
| M-22T ¼ wave 2m whip top | **$6.50** |
| M-25 ⅝ wave 2m whip top | **$16.50** |
| M27-R60T 5ft. 11m. C.L. whip top | **$21.00** |
| M-40T 4.5 dB Gain, 435 MHz | **$19.80** |
| M.B. Standard base | **$4.70** |
| M.B. UHF base | **$5.80** |
| MAGBASE inc. 12ft. of RG-58/AU | **$41.75** |

### ROTATORS

**Emotator:**

| | |
|---|---|
| 102LBX Similar to CD-44 | **$119.00** |
| 501CXX Similar to Ham II | **$179.00** |
| 1102MXX Extra Heavy Duty | **$259.00** |
| 1211 Mast bracket for 102LBX | **$12.50** |
| 1213 Mast bracket for 501CXX | **$19.00** |
| 300 Mast Support bearing for above | **$22.00** |
| AR-22 CDE Light Duty Rotator | **$85.00** |

### ANTENNA ACCESSORIES

| | |
|---|---|
| LA-1, Lightning Arrestor, for installation in standard 52 or 72 co-axial feedline, designed to Mil. specs. | **$49.00** |
| LA-2, smaller size co-ax arrestor | **$9.50** |
| BN-86, broad-band ferrite Balun, 2 kW for Beams and Doublets | **$26.00** |
| HN31 Cantenna Kit 1 kW oil cooled (oil not included) | **$36.00** |
| FF-50DX Low Pass Filter | **$32.50** |
| LP-7 TVI Filter low power | **$9.95** |
| VCTF Rotator Cable, suit Emotator | **80 cents** per yd. |
| Porcelain Egg insulators | **50 cents** |
| WIDE RANGE of Co-axial cable and connectors in stock. K-20 70 ohm Twin feeder | **30 cents** per yd. |
| Multi-band dipole traps centre insulator, 80-10m bands per pair complete with insulator | **$28.50** |
| Co-axial cable switches, 5 position, Model 590G | **$32.00** |
| CX-3, 3 position co-ax switch | **$7.95** |
| TWS-120, 2 position co-ax slide switch | **$12.00** |
| TWS-150, 5 position co-ax slide switch | **$21.00** |
| TWS-220, 2 position double pole slide switch | **$21.00** |
| RS-107 Transceiver tester | **$57.00** |
| RS-501 Ant. Impedance bridge Inc. 1 osc. | **$59.00** |
| Extra Osc. for RS-501 | **$12.00** |

### SWR AND POWER METERS

| | |
|---|---|
| **SWFS-2, single meter type,** combined SWR and FS meter, 50 ohms, inc. FS pick-up whip, size 5" x 2" x 2¼". 3-150 MHz, UHF connectors | **$18.00** |
| **SWR-2, dual meters,** 50 ohms. Simultaneous reading of forward and reflected power, 5" x 2" x 2¼". 3-150 MHz, UHF connectors | **$27.00** |
| **SWR-200 large dual meters,** switched 50-75 ohms, with calibration chart for direct power readings to 2 kW in three ranges. A very elegant instrument. 7⅝" x 2¾" x 3¾" | **$59.00** |
| **FS-600A Peak Reading Wattmeter SWR meter** 20, 200, 500 and 1000 watts 230 VAC operation. 3.5-30 MHz, very accurate | **$63.00** |
| **FS-301 Wattmeter/SWR meter** 20, 200 and 1000 watts 3.5-30 MHz | **$42.00** |
| **FS-09 Field Strength meter** | **$9.50** |

### ANTENNA COUPLERS

| | |
|---|---|
| **HC-75** Tokyo Hy-power labs. Trans-match 75w PEP | **$45.00** |
| **HC-500** Tokyo Hy-power labs. Trans-match 500w PEP | **$89.00** |
| **HC-500A** Tokyo Hy-power labs. inc. 160mx 500w PEP | **$94.00** |
| **HC-2500** Tokyo Hy-power pep trans. Trans-match 2.5 kw PEP | **$249.00** |

### OTHER ACCESSORIES

| | |
|---|---|
| **EKM-1A Audio Morse CP Osc** with speaker, one transistor, and tone control, requires one UM3 cell, in metal case 3⅝" x 2½" x 1⅛" | **$12.00** |
| **TC-701 Morse Practice** Osc. with built-in key and spkr. Inc. battery and auxiliary earpiece. Copy of morse code on case. Two can be wired together to form a practice communication set | **$18.00** |
| **MC-701 Mic. Compressor,** battery operated. Available with 4 pin mic. connector | **$49.00** |

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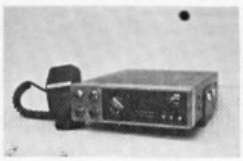
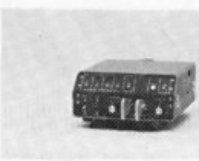
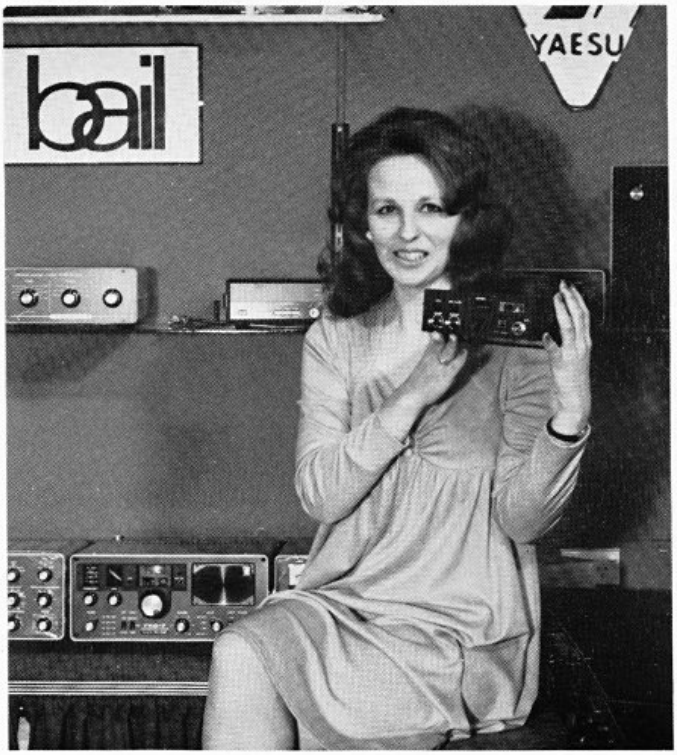




# YAESU AMATEUR EQUIPMENT




## MORSE KEYS

**EK-127 Electronic Keyer** .. .. .. .. .. .. .. .. **$84.00**
**EK-150S Single Paddle Electronic Keyer** .. .. .. **$92.00**
**EK-150D Double paddle electronic keyer** .. .. .. **$92.00**
**MK-1024 Programmable Keyer,**
1024 bit memory .. .. .. .. .. .. .. .. .. **$175.00**

**HI-MOUND**

**HK-710** De luxe heavy duty morse key. Heavy base. A really beautifully constructed and finished unit. Fitted with a dust cover, standard knob and knob plate. Ball bearing shaft .. .. .. **$33.00**
**HK-707,** Similar to above but with dust cover and standard knob. On standard base .. .. .. **$16.50**
**MK-701 Side Swiper** key to actuate an Electronic keyer .. .. .. .. .. .. .. .. .. .. .. **$33.00**
**BK-100 (BUG)** Semi-automatic bug key, fully adjustable .. .. .. .. .. .. .. .. .. .. **$39.00**

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Fred Swart
Greg Whiter
Fred Bail
Jim Bail
Brian Stephens
Also part-time staff not shown
Ken Jane
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| | DIGITRONICS, 186 Parry St., Newcastle West, 2302 | Ph. 69 2040 |
| QLD. | H. C. BARLOW, 92 Charles St., Aitkenvale, Townsville, 4814 | Ph. 79 8179 |
| | MITCHELL RADIO CO., 59 Albion Rd., Albion, 4010 | Ph. 57 6830 |
| A.C.T. | QUICKTRONIC, Jim Bland, Shop 11, Altree Crt., Phillip, 2606. | Ph. 81 2824 82 2864 |

JAS7677-13

# THE DEATH OF AMATEUR RADIO AS A HOBBY

Andrew Davis VK1DA
Licensed 11 years, Member WIA, Life Member ARRL

The recent reports giving incredible statistics of the imports of CB radios to the USA (for example, over half the value of air freight shipments being CB gear) were rather mind-boggling.

I remember being surprised, too, on reading that "point-of-sale-licensing" is now being practised in the U.S.A. This is an elegant phrase meaning that you get your licence and call sign from the dealer when you buy your gear.

But the latest report is that all new cars coming out of Detroit will soon be equipped with a combination AM/FM stereo/CB transceiver radio as *standard*. Just think! Every new car with CB in it! Well, that did it! I now reckon it's only a matter of time before the craze really spreads to Australia. Sure, 27 MHz will be a mess, like it is in the States, but the "citizens" don't care about spectrum pollution any more than they care about other forms of pollution. The 27 MHz pirates currently screaming about "rights to communicate" will turn pale at the interference on the band they wanted to be free to use. But what will amateur's reactions to all this be?

Some will stick their heads into the proverbial sand and pretend it is not happening. Others will react with righteous indignation and others with relief. Some won't notice and won't care when they find out.

I guess some will castigate me for putting these ideas into print. After all, it's tempting fate to speak of unpleasant things, let alone put them into print. This attitude is one of the basic problems faced today by amateur radio, and in Australia, the WIA.

In his report, Bob Arnold stated that *"the Institute's . . . policies must be geared to the closing decades of the 20th Century so far as events can be predicted"*. In recommending a change of name for the WIA he added that *"the word 'institute' is somewhat Victorian"*, so he feels that a change in name would help the members and the WIA to update to today and handle tomorrow better.

But he felt that the individual amateur and member was generally lacking something: *"one of the interesting facets of life which has come out of the investigation is the attitude of the amateur himself . . . Many comments . . . indicated a lack of understanding of various functions of the Institute . . . (one) hears the comment 'I do not have time to read AR or listen to the broadcast' but yet these people will talk in monosyllables for an interminable period, wasting many hours, a few minutes of which could be devoted to an understanding of the Institute. Perhaps this is part of our way of life today . . ."*

In Future Shock, Alvin Toffler says that *"as the rate of change in society speeds up, more and more older people feel the difference keenly. They . . . become drop-outs, withdrawing into a private environment, cutting off as many contacts as possible with the fast-moving outside world, and finally, vegetating until death"*.

I'm sure that this concept extends to organisations, too. Thus it is that the possible fate of the individual amateur, the WIA and the hobby itself is vegetation until death.

Our hobby could die of future shock. In order to cope with the future, the WIA must become more flexible, **its members must open their eyes, not drop-out.** Subjects like CB, the use of the term 'radio ham", and the progressive commercialisation of our hobby cannot be ignored. They must be faced realistically, the emotional reaction must be filtered out.

A WIA Federal Council resolved to ban the use of the term "radio ham". Yet how are we known to the general public? You give the answer.

Facing CB realistically, let's see what is in it for us. Some CBers will never tire of endless non-conversations (uncomfortably similar to those conducted by many amateurs), but others will be drawn to the technical side of the hobby and will become valuable members of the amateur body. If 5% of CBers were drawn to amateur radio, our numbers could double within a few years. Check the figures yourself.

Where else will the much-needed infusion of youth and enthusiasm come from?

What would you find more exciting, as a person wanting to "talk on the radio", CB or amateur radio? The amateur bands are full of endless monologues, morse, broadcast stations etc. and few of the conversations one hears are technical in nature; few of the contacts are other than "skeds". DX activity on some bands is dominated by a few, who take offence if any other station attempts to contact their DX station . . . On the other hand, many CBers *are* interested in fiddling with their equipment and antennas to improve signals etc. Many, too, are young and enthusiastic about their hobby. The illegal nature of "CB" in Australia only adds to the attraction. I suggest that amateur radio must often lose to CB even when the person concerned is interested in radio as a technical/communications hobby. Can we really be surprised?

Take a realistic look at the International scene and amateur radio's chances at WARC in Geneva, 1979.

Far from gaining HF bands, we run a serious risk of losing HF and VHF bands or at least parts of them. 146-148 MHz is in danger, 420-450 even greater danger. So you're not a VHF type? Never mind, you need not be smug. If possession was nine-tenths of ownership, you wouldn't have much left of 3.5, 7 or 14 MHz. By all means keep the 60 kHz at 1.8 MHz!

But it is certain that the events of WARC 1979 will pass almost unnoticed by many amateurs. Unnoticed until they call CQ on a band no longer allocated to amateurs. (I suspect that if amateur radio was declared illegal tomorrow, most skeds, DX activity, 2m FM contacts including repeaters would continue regardless for *years*. We would all be pirates, but amateurs now regard the use of "their" bands as a right rather than a privilege; does this sound familiar?)

Do you think your hobby is worth saving? I do, but scores of countries in the world do not (watch *them* vote in 1979).

To save it, we need to put on a new face and start thinking differently behind our faces.

Bob Arnold reckons the WIA needs a new face. Chances are, you haven't even read his report in April AR, so you couldn't be one of the uncaring ones.

Start taking Amateur Radio seriously. Or you may become a pirate.

— Reprinted from "Forward Bias", Sept., 1976. ■

# AMATEUR RADIO AT EASTLAND

Graeme Scott VK3ZR

**During the week July 26-31, the Box Hill Technical College ran a display of its various trade departments to show the public what courses are offered at the college. Parents of prospective students were able to speak to teachers and discuss the future careers of their sons and daughters.**

The college amateur radio station VK3BHT was operated portable in the shopping centre at Ringwood. As part of the college's facilities are devoted to teaching radio apprentices and technicians (evening classes), and of course, the form 5 Youth Radio Club Scheme, radio had to be represented.

On Monday 26th, I took my 14AVQ vertical, which covers 40, 20, 15 and 10 metres and installed it on the roof of the Eastland Shopping Centre. For 2 metre FM, I borrowed a Ringo from Vicom, and a power supply for the IC22a, and with the aid of some borrowed coax from Bail Electronics, we had our antenna system installed.

The FT200, and the IC22a were set up on the desk and, with an appropriate display of QSL cards and posters, we were on the air.

It wasn't long before we were informed that our SSB transmissions on 7, 14, 21 and 28 MHz were disturbing colour TV reception of the Olympic Games! Oh Boy! what to do?

Andy VK3UJ, came to the rescue on Tuesday with a low pass coax. filter. This however, did nothing to reduce the TVI. Later in the day, Andy tried his Uniden 2020 and the TVI was just as bad. We concluded that the TV antenna and our 14AVQ were too close; even though the TV antenna was line of sight to the Mt. Dandenong transmitters, just a few miles east of the centre. There was just plain overloading occurring in the Brash's TV store antenna system.

I then decided that a high pass filter was the only way we could get rid of the TVI. The form of the TVI was evidenced by sound bars completely wiping out the picture, lack of sync., and the reversion of monochrome by almost all the receivers, which, incidentally, were of diverse brands — local and imported.

The ARRL handbook was consulted and a high pass filter was constructed in a box made from a P.C. board laminate. I established good PR with the store manager, who was delighted that I was trying to solve the problem, as sales were being affected! (We were affecting cassette recorders etc. too, but that is another matter). Ultimately, the Olympics had priority.


**JULIE, XYL OF GRAEME VK3ZR OPERATING THE STATION**

I had no time to dip the coils in the filter, but just installed it in series with the coax to the store's distribution amplifier which was apparently overloading on our HF signals. Once connected, the filter degraded the TV signal slightly, so I tried spreading the turns on the coils, and achieved satisfactory pictures. Once that was achieved, I told the store manager that I'd start transmitting and would he watch for any further trouble.

As it happened, I could see some TV sets from my operating position and 7 MHz and 14 MHz signals had no effect, on the Olympics etc. I felt that I'd achieved something, and proceeded to log many contacts TVI-free.

Thanks to the excellent response and co-operation of amateurs contacted, I was able to put a number of members of the public onto the SSB and FM microphones and they were able to see Amateur Radio in action. The young boys, especially enjoyed talking to someone at the other end of the microphone.

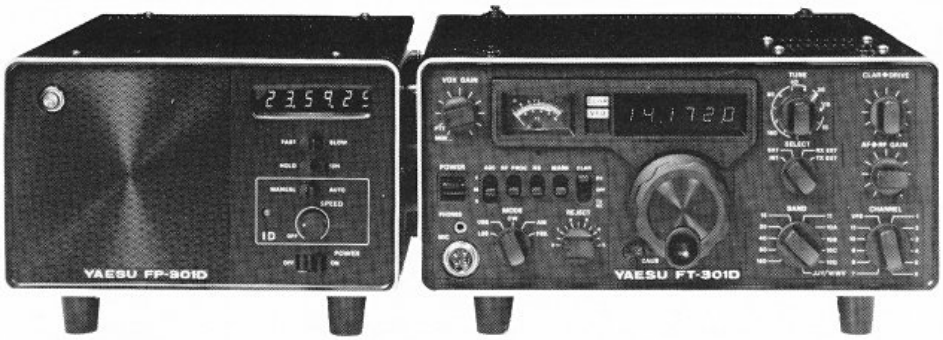
On Saturday 31st, many VK2's and VK5's were contacted on 7 MHz. My special thanks to Ern VK2AJ whose QSO I interrupted to obtain an interstate contact. Once established, we were called by VK5's, VK2's, VK3's and VK7's. Rob VK2AGK was worked 5-9-QSB mobile in Newcastle using a Uniden and a Hustler whip. You certainly were getting out well Rob!

Later on in the morning, VK3AMR at Monash University was contacted. The University's open day was on and an FT200 was being used with a G5RV to show off Amateur Radio at the Uni.

Overall I feel the display was a great success and it was gratifying to see so much interest in Amateur Radio. A few CBers were put on the right track, and might be doing the NAOCP or AOCP course at VK3BHT in the evenings in 1977.

WIA membership forms and amateur licence details were taken by many people, so hopefully the whole exercise has been, or will be, quite fruitful. ■

# REVIEW OF THE YAESU FT301D TRANSCEIVER




It seems that the future is getting closer all the time. The Yaesu FT301D is a case in point. Contained in a package only 280 mm wide, 125 mm high, and 370 mm deep is a fully solid state, 200 watt input, all band HF transceiver with just about every feature that the imagination could conjure up.

However, back to the beginning. The advent of fully solid state HF transceivers for the amateur market has been slow and surprisingly from the United States rather than from Japan. Prior to the new Yaesu FT301 series there have been at least four different American models available in this country over the last year or two. One can only guess the reasons for the rather late appearance of the Japanese equivalent.

The Yaesu Musen Co. are to be congratulated on their new product which will undoubtedly set the pace for other manufacturers to follow.

The FT301 series consists of four models: either 20 or 200 watts input, with or without digital dial readout. The model to be reviewed has the full 200 watts input and the digital readout. Certain other features are optional and these will be itemised later.

**TECHNICAL FEATURES**

The FT301D transceiver covers all the HF amateur bands in 500 kHz segments. These are 1.5 to 2.0, 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 21.0 to 21.5, 27.0 to 27.5 and 28.0 to 30.0 MHz in four segments. Operation is provided for SSB with upper or lower sideband, CW, FSK, and AM. The transceiver is supplied with the normal 2.4 kHz filter for SSB operation but it is possible to instal both a 600 Hz filter for CW and a 6 kHz filter for double sideband AM operation. As far as is known this is the first time that a full bandwidth AM filter has been available in an HF transceiver.

Following in the tradition of the FT101E an RF speech processor is included. Another first in HF rigs of this type is a receiver notch rejection filter. Naturally all the other normal features that one expects are there. These include, noise blanker, calibrator, clarifier for receive or both transmit and receive, VOX, external VFO switching and fixed channel operation with eleven crystal positions provided. Three different AGC time constants are switch selected from the front panel and allow fast, medium, and slow decay times.

In addition to the band coverage mentioned above, a bandswitch position is allocated for WWV reception on 5 MHz. This is slightly different to normal in two aspects; firstly in the frequency chosen, and secondly that it is fixed tuned to exactly 5 MHz, with an internal trimmer to set the actual zero beat point.

The transceiver requires a source voltage of 13.5 and is therefore all ready for mobile or portable operation from a normal car battery. For home station use the matching FP301 AC power supply is recommended. This unit is capable of delivering 13.5 volts at 25 amps with excellent regulation.

As the photo of the FT301 shows, it bears a strong resemblance to the FT221 two metre transceiver reviewed in the June issue of this magazine. It does indeed share the same front panel and cabinet as well as the plug-in printed board internal layout.

Another design feature of the FT301D is the broadband transmitter driver and output stages. This eliminates the need for the usual final tuning and loading controls. However, in common with all circuits of this type, a close 50 ohm match is required for the output stage to deliver maximum power. Perhaps to satisfy doubts that the receive front end is really peaked up for maximum signal a 'Drive' control calibrated for each amateur band is brought out to the front panel. This operates a permeability system similar to that in the FT101 series transceivers and tunes the receiver front end and the low level transmitter stages. There is no doubt, it's a good feeling to peak this up and know everything is on the nose.

**THE FT301D CIRCUIT**

After looking at the technical features, we will now see just how it's all done. The FT301D is of single conversion design. With an IF frequency of 9 MHz the conversion scheme is rather like the FT200. The FT101 on the other hand is a double conversion design with a second IF and sideband filter at 3180 kHz. The receiver front end of the 301D uses the now almost standard 3SK40M dual gate FET as the RF amplifier and also as the first mixer. The IF amplifier section starts off with a ± 10 kHz monolithic filter which helps to improve the receiver front end performance in such aspects as cross modulation. This is followed by two stages of amplification before the main filter section is reached. As mentioned before, three filters can be installed and these are diode switched along with the function switch. Unfortunately, the FSK position on the function switch is not explained in the instruction book and it is not clear whether an RTTY filter is available, and if it can be installed. Our review sample had only the standard SSB filter installed and this was in circuit in all positions of the function switch.

The output of the VFO unit is premixed with the output of the heterodyne oscillator to produce the transmit frequency, or to convert the input frequency to the 9 MHz IF, on all bands except on 80 metres where the 5.5 MHz VFO is subtracted directly from the 9 MHz IF to produce 3.5 MHz. The crystal frequencies in the heterodyne oscillator range from 16 MHz for the 160 metre band to 44 MHz for the 29.5 MHz segment of the 10 metre band. An interesting feature of the audio section of the receiver is the inclusion of a top cut filter with a sharp cut-off above 2.6 kHz. This provides very clean audio with a complete absence of high frequency hiss.

The rejection filter works very much like the old single crystal filter common in communications receivers of the eara post war years. A single crystal of about 9 MHz nominal frequency is series tuned with a small variable capacitor to vary its resonant point across the band pass of the transceiver. In all a very simple but effective idea. It's a wonder someone has not thought of it before. The idea should be adaptable to most existing transceivers.

A separate AM detector is provided, however it was unfortunate that the optional AM filter was not installed so that we could check out the AM performance.

While the transmitter circuitry is fairly conventional a few interesting design points are worthy of mention. The RF processor is designed to produce similar results to the one installed in the Yaesu FT101E. It is, however, operated at the 9 MHz IF frequency of the FT301D rather than 2180 kHz. A second 9 MHz filter is

included to remove the distortion products produced in the clipping process.

The 301D output stages consist of two broadband amplifiers in cascade. The output of the 10 watt driver stage is connected via a BNC coax fitting to the 100 watt final stage which is attached to the rear of the cabinet as a separate unit. The output of the final is routed back into the transceiver proper via a second BNC connector to the output filter section. If low power operation, or drive an external transverter is required, it is simply a matter of taking output from the appropriate BNC socket.

The digital display as fitted to the FT301D is set up to read the VFO frequency. The 5.0 to 5.5 MHz of the VFO is converted to 13.0 to 13.5 MHz which is the frequency at which the display counts. The MHz prefix for each band is produced by a diode matrix switched by the band switch. Although the display reads to 100Hz points the counter itself reads down to the 10 Hz points. This is to eliminate flicker which would otherwise occur on the last digit.

Front panel indicator lights set between the dial readout and the 'S' meter show clarifier operation, and VFO or fixed channel selection.

**THE FP301 POWER SUPPLY**

This supply will be available in two versions. The FP301D also includes an LED digital clock which can be switched to give either a 12 or 24 hour readout. It also has an automatic CW identifier into which the owner's call sign can be programmed. As a sample of this supply was not available at the time this review was compiled we cannot comment on its operation.

The standard FP301 supply is capable of delivering 13.5 volts at a maximum current of 25 amps. The regulation from no output to 20 amps is better than ½ volt. A total of five transistors, four in the output, one driver plus one IC to provide overload protection, and a heavy duty diode bridge make up the solid state compliment.

As Yaesu suggest this supply could be very handy around the shack to power other pieces of gear — even that old valve FM rig.

**THE FT301D ON THE AIR**

Setting up the 301 and getting on the air is a very simple procedure. The power input from either the AC power supply or the 12 volt DC source is via a 12 pin Jones socket on the rear of the transceiver. The antenna connector is a standard SO239. Yaesu supply a good quality push-to-talk dynamic microphone fitted with the now standard four pin screw-on connector. As soon as the power switch is closed the set comes instantly to life — both on transmit and receive. After providing a 50 ohm antenna, bands can be selected by simply setting the band switch and peaking the 'TUNE' control for maximum receiver output near the calibrated point for that particular band.

The main tuning control, which is a combination of gear and planetary drive, is extremely smooth. A finger hole is provided to fast tune from one band section to another and this is of adequate size to really spin the knob at a fast rate.

The digital readout is very clear and indicates frequency to the 100 Hz points. There are five digits on 80 and 40 metres and six digits on 20 metres and above. The actual size of the readout is 60 mm wide and 10 mm high. Tuning a transceiver with a digital readout takes getting used to. The initial tendency is to overshoot when aiming at a specific frequency and it takes quite a bit of practice to stop at a predetermined point.

Receiver performance is excellent. The fast-medium-slow AGC selection enables the correct amount of delay to be set to suit the strength of the incoming signal. For instance on 80 metres at night with a moderate static level and fairly strong signals, the slow AGC setting gives a marked increase in signal to noise ratio.

The receiver rejection filter was most effective in removing heterodynes of stations tuning up on or near the operating frequency. An interfering signal reading 20 dB over 'S'9 could be reduced to about 'S'3 and this amount of rejection remained much the same regardless of the actual beat frequency.

Receive audio through the speaker built into the matching power supply was very easy to listen to. The combination of very good AGC action, low distortion in the SSB detector and receiver audio section, and a well matched speaker all added up to much better than average results.

Transmitter tune up consists of advancing the 'DRIVE' control for a 10 amp reading on the meter, peaking the 'TUNE' control for maximum current and then further advancing the drive control for a 15 amp reading. So long as the final is properly matched this reading will indicate a full 200 watts input.

We checked the actual power output on each band with a Swan WM-1500 power meter and the FT301D connected to a Heath Cantenna 50 ohm dummy load. A Heath SB610 monitor scope was also in circuit to determine the PEP output. The following results were obtained.

| BAND | RMS OUTPUT | PEP OUTPUT |
|---|---|---|
| 160 | 100 watts | 100 watts |
| 80 | 110 watts | 120 watts |
| 40 | 150 watts | 150 watts |
| 20 | 75 watts | 75 watts |
| 15 | 125 watts | 120 watts |
| 15 | 100 watts | 125 watts |

No reason could be determined for the slightly lower output on 20 metres but the difference is small in practice. The output wave form on the scope was true copy book style in both the CW and SSB modes. In fact the CW carrier pattern was the cleanest of any transmitter so far tested.

It appeared that the transmitter could be run at full input in the CW mode almost indefinitely. After several minutes of such operation the heat sink of the transmitter was only moderately hot but the power supply heat sink was very hot and could represent a hazard to unsuspecting people if in an exposed position. Under normal SSB operation it did not get quite as hot but after a lengthy period with continual use of the RF processor, the temperature built up to quite a high degree.

The action of the processor was quite satisfactory and appeared to produce about 20 dB of clipping. No panel control was provided for adjustment of the clipping level. In use on the air it produced results similar to clippers reviewed earlier this year.

On air reports of the transmitted audio quality were all most satisfactory and in all cases a great deal of interest was expressed in the unit.

VOX operation was quite smooth and an adequate degree of adjustment was provided on the delay and anti-trip controls to enable the most critical VOX enthusiast to set them to his liking. Mechanical noise from the relays was moderately high but no electrical clicks or plops were audible. The VOX was also satisfactory for CW operation however the delay required for this mode is usually much shorter and it is necessary to remove the transceiver lid and reach through a small hole with a fine screwdriver to make the change. The microphone gain control is also an internal preset. It is however provided with a plastic shaft to make adjustment easier.

The front panel controls are a mixture of good and bad so far as operation is concerned. The bad points were mostly covered in the review of the FT221 and unfortunately persist in the 301D. Although the lamp illuminating the meter has been increased in output, the scale is still hard to read. A return to the translucent type scale with rear illumination as used on the FT220 series is badly needed.

The panel knobs have no white indicator to show which way they point. Admittedly there is a small raised moulding but it is easy to miss this when the control is gripped in the normal way.

VFO stability was checked and found to easily meet the specified 100 Hz per half hour. Drift for the first half was almost exactly 100 Hz, and over the next hour and a half did not exceed 150 Hz. However, over the same period of time, the digital readout shifted 800 Hz. An interesting case where the VFO is more stable than the frequency counter.

Calibration of the dial to the marker oscillator was a little different to setting a normal type dial. The transceiver was tuned to zero beat and then the 'Calibrate' control adjusted to bring the readout to the zero point. As no offset shift is provided on the VFO with change of sideband, it is necessary to recalibrate when changing from upper to lower sideband. When the offset tuning is adjusted however the readout changes accordingly; you only have to remember what it was before.

Another unfortunate carry-over from the FT221 is the use of miniature 3.5 mm

BUILD IT YOURSELF

# Heathkit station accessories

## "Cantenna" Dummy Load

1 kW max input; 1.5-300 MHz w/SWR 1.5:1 or less. Oil not incl.

**Kit HN-31, $28.50**


HN-31

## Heathkit Coax Switch

Switches an RF source to any one of several antennas or loads; unused outputs grounded. Use two to switch up to four different transmitters, receivers, etc. 1.1:1 max SWR to 250 MHz. 2 kW PEP max power rating.

**Kit HD-1234, $20.75**

## Heathkit HF Wattmeter/SWR Bridge

Remote detector permits placement of meter in any convenient location... 6 ft. of cable supplied.

**Kit HM-102, $51.20**

**HM-102 SPECIFICATIONS — Frequency range:** 1.8 to 30 MHz. **Wattmeter accuracy:** ±10% of full-scale reading. **Power capability:** 10 to 2000 watts. **Impedance:** 50 ohm nominal. **Connectors:** UHF type SO-239. **Dimensions:** 5¾" H x 5¼" W x 6½" D.

## Heathkit VHF Wattmeter/SWR Bridge

**Kit HM-2102, $51.20**

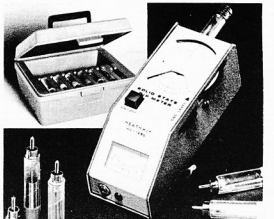
**HM-2102 SPECIFICATIONS — Frequency range:** 50 MHz to 160 MHz. **Wattmeter accuracy:** ±10% of full-scale. **Power capability:** To 250 W. **SWR sensitivity:** Less than 10 W. **Impedance:** 50 ohms nominal. **SWR bridge:** Continuous to 250. **Connectors:** UHF type SO-239. **Dimensions:** 5¼" W, 5¼" H and 6½" D, assembled as one unit. *Using a 50 Ω noninductive load.

## Heathkit HP-23B Fixed-Station Supply

HP-23B SPECIFICATIONS

**Power requirements:** 120/240 VAC, 60/50 Hz, 350 watts maximum. **High voltage output:** 820 VDC no load; 700 VDC @ 250 mA ±10% AC ripple: Less than 1% @ 250 mA. Duty cycle: 150 mA continuous to 300 mA @ 50%. **Low voltage output** (High tap) 350 VDC, no load; 300 VDC @ 150 mA ±10%. (Low tap) 275 VDC, no load, 250 VDC @ 100 mA; ±10%. Less than .05% AC ripple @ 150 mA, continuous duty to 175 mA. **Fixed bias:** −130 VDC ±10%, no load; −100 VDC @ 20 mA. **Filament voltage:** 12.6 VDC @ 5.5 amps. **Dimensions:** 9" L x 4¾" W x 6¼" H.

**Kit HP-23B, $98.50**

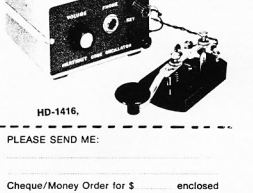


HD-1250,

## New Heathkit solid-state Dip Meter

Another Heath value triumph — a better dip meter at lower cost. The Colpitts oscillator covers 1.6 to 250 MHz in fundamentals with a MOSFET paraphase amplifier and hot-carrier diodes for more sensitivity and a better dip. It uses a Q-multiplier for greater detector sensitivity and a responsive 150 μA meter movement for positive resonance indications. It includes a phone jack for modulation monitoring. It's smaller and lighter than others, too. Completely portable. Whether you're checking resonant frequencies, adjusting traps, looking for parasitics, or using it as a signal generator, the HD-1250 is designed to go anywhere. It fits your hand and thanks to its solid-state design and 9-volt battery operation, it's ready to use instantly wherever you are. The custom molded gray carrying case protects the meter and the 7 color-coded, pre-adjusted, plug-in coils in transit, and makes a handy storage place.

**Kit HD-1250, $89.00**




HD-1416,

## Heathkit Code Practice Oscillator

**As much fun to build as it is to use — and it makes a great starter kit for a beginning CW operator. The molded plastic cabinet with dark green front panel matches Heathkit "SB" series gear.**

**Safe, portable and reliable, the HD-1416 is designed in the Heath tradition of top quality and value. Most components mount on a single circuit board for easy assembly. The unit operates from a single inexpensive 9-volt transistor battery (not supplied) and comes complete with telegraph key and phone jack. The oscillator, with built-in speaker, has a separate control for volume on the front panel — as well as a tone control accessible from the back of the cabinet. The HD-1416 can also be used as a side tone oscillator with any transmitter using grid block keying — such as the Heathkit DX-60B.**

**Kit HD-1416, $20.00**

**HD-1416 SPECIFICATIONS**

**Mode of Operation:** Speaker or headphones. **Tone Frequency:** 200-800 Hz adjustable. **Battery Required:** 9-volt transistor battery equivalent Nedla #1604 (not supplied). **Speaker:** 45 ohms. **Headphones:** 8-2000 ohms. **Sidetone Oscillator:** Grid block keying transmitters (400 volts DC, negative maximum). **Controls:** Volume, Tone (internal). **Front Panel Connections:** Key, Phone jack. **Transistors:** (2) MPSA20, (1) 2N5249. **Color:** Wrinkle grey and dark green.

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**220 Park St., South Melb. 3205. (Ph. 699 4999)**

**HEATHKIT**

sockets for the headphone and key connections. Perhaps Yaesu is trying to set the trend, but until this is established these miniature jacks are awkward to use.

**INSTRUCTION MANUAL**

The manual supplied with the FT301D is presented in the typical Yaesu manner. Some forty-six pages cover the following subjects. General Description, Specification, Controls and Switches, Rear Panel Connections, Preparation for Operation, Operation, Block Diagram, Circuit Description, AC Power Supply, Frequency Counter Unit, Maintenance and Alignment, and Parts list.

The circuit description section provides a circuit diagram of each printed circuit board and a clear description of its operation and how it ties in with the whole set. The maintenance and alignment section provides adjustment information for the multitude of preset controls. Unfortunately no printed circuit layouts are included.

Each time I complete a review of a new transceiver I wonder how and who will service it in the future when the need arrives. There is no doubt that the modern transceiver is a very reliable piece of gear. It is also highly complex and requires more than the old multi-meter to trouble shoot.

In this regard it's nice to know that competent service is available from the distributors of Yaesu gear in Australia. As of now Bail Electronic Services supply with every piece of gear sold a check list covering some 53 different points. A copy of this is retained by the distributor and so at any future date the performance can be compared with the original.

The FT301D used in our review was supplied by Bail Electronic Services from whom details of price and delivery can be obtained. ■

# NEWCOMERS NOTEBOOK

*Rodney Champness, VK3UG*
*David Down, VK5HP*

## AN AUDIO KEYING SYSTEM FOR TRANSMITTERS

**This device is designed to accept audio in the form of morse code from a tape recorder to key a transmitter. You may ask of what value is such a device to the average amateur? It is perhaps of value to those amateurs who assist newcomers to amateur radio with slow morse practice and who wish to use their tape recorder to send pre-recorded slow morse. I wrote an article a few months back dealing with slow morse and this is the equipment that can be used by the slow morse transmitting stations in the course of conducting those sessions. To the newcomer this circuit appears to have no relevance. However, it is most useful to show people how the differing characteristics of silicon and germanium semi-conductors can be used to complement one another.**

It is assumed by many people that diodes, whether they be semi-conductor or valved, conduct in the forward direction as soon as the voltage applied starts from zero. However, this is not true and the voltage has to build up to an appreciable fraction of a volt before the particular diode will conduct. Germanium diodes appear to have a turn on voltage between 0.15 and 0.333 volts, whilst silicon diodes have a turn on voltage between 0.5 and 0.7 volts. These characteristics are used in this audio keyer to simplify the overall circuitry.

This keyer will accept audio inputs which vary between about 0.4 volts and 6 volts RMS and key reliably. The minimum power necessary to actuate the keyer is less than 10 milliwatts if the geranium diodes have a low switch on voltage. The audio is fed into the audio jack to R1 and the two back to back silicon diodes D1 and D2. D1 and D2 will not conduct unless the audio peak voltage rises above 0.5 volts. They will then clip both peaks of the wave and as the input level rises to higher levels it will clip the audio input to 0.7 x 2 = 1.4 volts peak to peak. This clipped audio wave is then presented via C1 to a half wave voltage doubler using two geranium diodes D3 and D4. The turn on voltage of these two diodes is approximately 0.2 volts, so the capacitor C1 is charged up to 0.5 volts on the first half cycle. On the second half cycle this voltage 0.5 volts, plus the other clipped half cycle of 0.7 volts, is added to give a pulse of 1.2 volts. However, 0.2 volts of this is lost in the voltage drop in D4, so potentially 1 volt is present across C2. D5 is another silicon diode wired for forward conduction and it conducts clipping this voltage to between 0.5 and 0.7 volts VDC positive with respect to earth. R2 acts to discharge C2 completely between morse code characters. The voltage across C2 is applied to TR1 a geranium small power transistor via a base current limiting resistor R3. The transistor is switched on and draws current sufficient to pull in the relay which keys the transmitter. The switch on voltage of a germanium transistor is of the order of 0.15 to 0.2 volts.

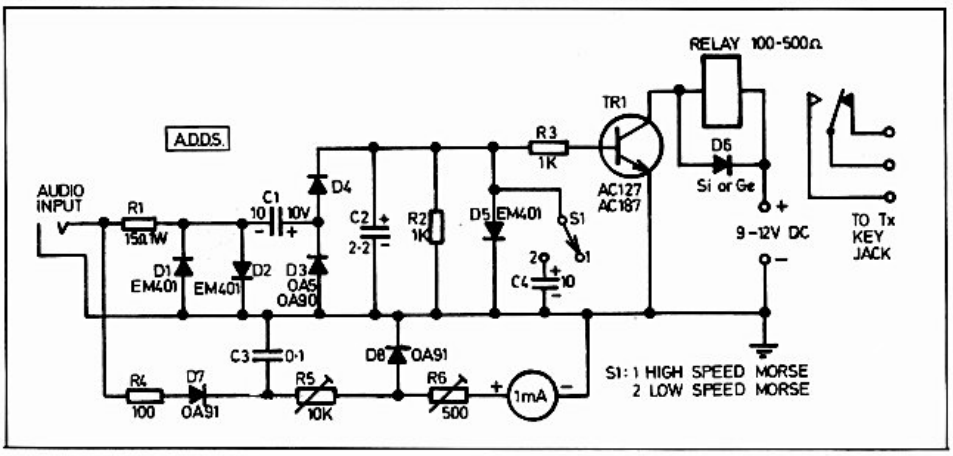
The keyer is a relatively simple device which is tolerant of variations in audio input levels of between 20 and 30 dB. The diodes D1, D2 and D5 clip the input wave and resultant DC output to a relatively constant level despite variations in input level. The diodes D3 and D4 rectify the audio and produce a DC voltage which actuates the transistor and relay. If all silicon devices were to be used the circuitry would have been considerably more complex with several more active devices being used.

The audio level meter is not strictly necessary, but can be a useful addition to make sure the level from the tape recorder is sufficient to actuate the device reliably. R4 is a peak current limiter for the audio level diode D7. C3 filters the output and the DC is applied via R5 and R6 to the 1 mA meter used to read the audio input level. R5 is set such that the meter registers 20 per cent of full scale when the keyer is keying reliably.

The audio level is increased such that the meter needle hits the stop with R6 at minimum resistance. R6 is then adjusted such that the meter lazily approaches the FSD stop. If the input is increased further, the meter needle will not bang hard against the stop with high level audio morse coming into the keyer.

The audio level is set at 50 per cent of full scale deflection (FSD) to make allowance for variations in tape output levels and the tape lifting off the tape heads when keying a transmitter.

The voltage drop across the meter and R6 is arranged to be slightly greater than the turn on voltage of D8, so that the meter will not suffer heavy overload if a

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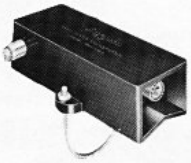

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DRAKE TV-3300 TVI low pass filter **$28**
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DRAKE MN-2000 matching network **$230**
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All prices quoted are net SYDNEY, N.S.W., on cash-with-order basis, sales tax included in all cases, but subject to changes without prior notice. ALL-RISK INSURANCE from now on free with all orders over $100; small orders add 50c for insurance. Allow for freight, postage or carriage; excess remitted will be refunded. For prompt and economical despatch we use ANSETT air freight and COMET road service.

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PETER SCHULZ, VK2ZXL.

high output is put into the audio keyer. You will see many multimeters with diodes placed across their terminals. These are usually silicon diodes with a turn on voltage of 0.5 to 0.7 volts whilst the meter may well have a FSD sensitivity of 0.1 volts drop across it. The meter will suffer a 5 to 7 times FSD overload before the diodes have any effect. It is rather doubtful in some cases whether in fact the protection diodes are any real value. The meter in the audio morse keyer, as you can see, is fully protected against overload.

I hope that you have found this little excursion into some of the rarely exploited features of silicon and germanium diodes of interest, each type having its own particular points. — VK3UG. ■

**DIODE CHARACTERISTICS**

| Type No. | Type | Volts drop at 0.3 mA | Volts drop at 30 mA |
|---|---|---|---|
| EM404 | Silicon | 0.5V | 0.7V |
| OA5 | Ger. | 0.15V | 0.4V |
| GEX66 | Ger. | 0.16V | 0.65V |
| OA91 | Ger. | 0.22V | 1.00V |

# VHF-UHF
# AN EXPANDING WORLD

*Eric Jamieson, VK5LP*
Forreston, 5233

**AMATEUR BAND BEACONS**

| | | |
|---|---|---|
| VK0 | VK0MA, Mawson | 53.100 |
| | VK0GR, Casey | 53.200 |
| VK1 | VK1RTA, Canberra | 144.475 |
| VK2 | VK2WI, Sydney | 52.450 |
| | VK2WI, Sydney | 144.010 |
| VK3 | VK3RTG, Vermont | 144.700 |
| VK4 | VK4RTL, Townsville | 52.600 |
| | VK4RTT, Mt. Mowbullan | 144.400 |
| VK5 | VK5VF, Mt. Lofty | 53.000 |
| | VK5VF, Mt. Lofty | 144.800 |
| VK6 | VK6RTV, Perth | 52.300 |
| | VK6RTU, Kalgoorlie | 52.350 |
| | VK6RTW, Albany | 52.950 |
| | VK6RTW, Albany | 144.500 |
| | VK6RTV, Perth | 145.000 |
| VK7 | VK7RNT, Launceston | 52.400 |
| | VK7RTX, Devonport | 144.900 |
| | VK7RTW, Lonah | 432.475 |
| VK8 | VK8VF, Darwin | 52.200 |
| 3D | 3D3AA, Suva, Fiji | 52.500 |
| JA | JD1YAA, Japan | 50.110 |
| HL | HL9WI, South Korea* | 50.110 |
| KG6 | KG6JDX, Guam | 50.110 |
| KH6 | KH6EQI, Hawaii | 50.104 |
| ZL1 | ZL1VHF, Auckland | 145.100 |
| ZL2 | ZL2MHF, Upper Hutt | 28.170 |
| | ZL2VHP, Palmerston North | 52.500 |
| | ZL2VHF, Wellington | 145.200 |
| | ZL2VHP, Palmerston North | 145.250 |
| | ZL2VHP, Palmerston North | 431.850 |
| ZL3 | ZL3VHF, Christchurch | 145.300 |
| ZL4 | ZL4VHF, Dunedin | 145.400 |

**SIX METRES OPENS . . .**

And how! Saturday 23/10/76 . . . the day of the sun eclipse will be remembered in several ways. I journeyed 250 miles to the south-east of VK5 and from my position at Southend, a little seaport up the coast from Mt. Gambier, was fortunate to enjoy many breaks in the cloud cover to allow 53 colour slides to be taken of the eclipse — these are now being processed so hopefully some will be OK. Of course things do happen on the few occasions I leave my premises, and this time it happened in a really big way. First news of something special came in a phone call from VK7JV who advised that on 23/10 six metres opened to VK4 during the morning. At 0200Z John heard a JA call sign, answered him, and back came a VK4. After working him, the JA was gone, but on tuning the band more JA stations were heard.

For a period of an hour JA stations were available in Tasmania and a total of 16 were worked. John VK7JV worked 9, Joe VK7JG (ex-7ZGJ) and Kevin VK7ZAH each 5. Signals varied from S4 to S9. Districts available were JA1, JE1 2 and 3, JH2, JR3 and JE3. They heard JH1ECU working a VK3, so they knew the VK3 boys were in on it too.

Many thanks for the news John, the promptness of advice is very much appreciated. I also thank Joe VK7JG who phoned to advise of the incorrectness of the call sign for the six metre beacon in Northern Tasmania. I had been listing it as VK7RMT instead of VK7RNT; the correction is now in effect.

Well, that phone call from VK7JV started me almost wishing I had stayed away from the eclipse, but then a day or so later in rolled a bulging envelope from Steve VK3BIZ in Melbourne, crammed full of news of the opening on that Saturday. The best I can do is to largely give you the news as it came to me as it is all so interesting, and will have a lot of mouths watering before the reading is finished. I am much indebted to you Steve for the constant information you feed me, and this one being so special will be appreciated by all the DX gang.

Steve writes: "What a fantastic 6 metre day 23/10/76. Commencing 0021Z VK4 were worked from Melbourne to Brisbane and up to Ingham areas. Whilst working 10 metres VK4GI came up calling CQ on 6 metres at 0358Z. I was in contact with UA0LBU on 10 metres at the time. I called VK4GI just to say hello. I was still in QSO with UA0LBU, and suddenly bang! A huge signal came up over the top of VK4GI signing JH6UNN, then JH1ECU 5 x 9++. I signed with the Russian station after relaying the JA's back over 10 metres showing him the strength. The following areas were worked:

0400-0432 JA1 — All Prefectures.
0432-0439 JA2 — Three Prefectures.
0439-0445 JA3 — Osaha.
0445-0447 JA4 — Okayama.
0449 JA5 — Kagawa.
0449-0452 JA0 — 2 Prefectures.
0500 JH6 — Fukouka.
Heard were JA7, but no JA8 or JA9.
0530 JR6 — Okinawa Island.

No HL9WI beacon, plenty of JA's on 50.150. Television birdies all around 50 MHz peaking north.
0451 — JR2OUP 5 x 5 worked.
0505-0515 CW CQ from VK3BIZ. QRZ call to ?A0CC? Called JA0CC.

Response in CW: QSY QSY QSY. I moved to 52.010. Called JA0CC?

Response QSY down 20. I moved to 52.000. Cal'ed QRZ JA0CC? No response.

Tuned down to 51.990 and heard VK3BIZ VK3BIZ de UA0CCW K.

I offset clarifier, gave 569 RST at least 10 times and QTH.

Response: VK3BIZ de UA0CCY 569 UR RST name Vlad QTH . . . noise etc. QSB. More tries, same results, noise etc.

0521: UA0CCW de VK3BIZ.

Response: SB SBY . . . QSB . . . noise . . . then VK3BIZ de RA0CCM RA0CCM K.

Response: RA0CCM ? ? VK3BIZ RST 539 539 K.

Response: VK3BIZ de RA0CCM name Victor QTH Kha . . . vk . . . ? . . . noise QSB.

Me: R R R RA0CCM de VK3BIZ RST 539 name Steve k. etc. etc.

Response: R R R VK3BIZ de RA0CCM RST 539 Steve O.K. OM. K.

Me: R R R Victor OM TU FB QSO PSE QSL via BURO PSE K K.

Response: R R R 73 73 73 VK3BIZ . . . noise etc. de RA0CCM K.

Me: R R R 73 73 73 de Melbourne, Australia etc. Need I say any more?

A contact with JR6RAY was then started at 0536 from Okinawa on 52.001 but signals QSB into noise, and all TV birdies disappeared by 0600Z. I then moved to 10 metres and worked many more JA and UA0 stations.

Following is some Russian VHF information: UA0CCA to UA0CCZ indicates a class of licence, full class up to 500 watts.

RA0CCA to RA0CCZ indicates a technical or novice type licence to 50 watts.

Location: City of Khabarovsk 800 miles NNE of Vladivostok. Postal: Care of Box 024, Vladivostok No. 10. Soviet Russia.

Six metres allocation on a Club basis only, 50 to 52 MHz. VHF Propogation studies. Antenna: Some type of sterba curtain array. 500 watts output from some sort of Government transmitter, modes FM, CW or AM, no SSB.

Two metres: Allocation 144-146 MHz. FM, CW or AM, no SSB. Power output 200 watts. Antenna 10 element yagi, with 15 element proposed.

JA0-9. Worked on 2 metres tropo July to September 1976, also Western Russia on 2 metres.

In future suggested procedure call on 28.600 SSB for response and nominate 52 MHz frequency For those with transceiver, use your clarifier with 10 kHz offset, transmit on 52.005 and listen 51.995.

Stations worked during the opening: VK3BIZ 14 JA's, VK3AKK 11, VK3AMK 5, VK3ZRY, VK3ZSJ each 5 etc. etc.

**STOP PRESS:**
ZL1VHF beacon copied on 145.100 by K6QJS/KH6 last week! . . ."

Again, many thanks Steve for that interesting run down. This will certainly help to keep six metres more alive this year, and indicates we may not have to always wait for the sunspot peaks to find the long distance DX. With better equipment, and probably with more people able to be around with spare time such contacts may become more common. However, once again it demonstrates the disadvantages we are facing by our 2 MHz allocation above the world wide standard of 50 to 52 MHz. With the case of the Russian stations, they cannot come up into our segment and we cannot go down into theirs, which means all such activity has to be crammed into a few kHz at the band edge.

**GENERAL NEWS**

Peter VK4APG writes to advise of a message received on 20 metres that Joe AG6ADX on Guam operates a beacon from 0800 to 1000Z on 52.050 with 250 watts to a 4 element yagi pointed at Australia. The beacon is CW signing "CQ call sign Guam" then listening period before keying again. Joe monitors frequency during breaks Many thanks Peter.

I have also received a letter from Mike, call sign not mentioned, who is now living at Ceduna in ex-VK5SU territory. Mike advises being able to operate on 6 metres SSB with an FTV650 and FT200 to a 5 el. yagi at 50 feet, and on 2 metres SSB with an IC202 with 3 watts at present, but eventually 300 watts, to a 9 el. yagi at 60 feet. He is building a 4CX250B linear but with the usual problem of some parts. Plans are to eventually monitor the Adelaide Channel 8 repeater. Mike will be somewhat limited for time to operate and indicates therefore the Ross Hull Contest will not be in jeopardy from there for the time being.

Anyway, it's good to hear that activity will continue on VHF from Ceduna, and both the VK5 and VK6 boys will be interested to do some listening, particularly when you have 300 watts on 144 MHz SB.

**MOONBOUNCE REPORT**

From Lyle VK2ALU and "The Propogator" comes the monthly EME report which mentions that the scheduled moonbounce tests were carried out on the morning of 26/9 with W5LO, who was not heard, and W5LUA, who transmitted he was hearing VK2AMW at "M" copy. We heard his signals weakly for most of the test period and they came up to 5 dB above noise on his last transmission.

This allowed copy of full call signs but the test period ran out before a contact could be made.

"Letters were received from K3PGP and W4ZXI before the test weakened, requesting tests with each of them during the hour immediately prior to the scheduled tests. However, moonrise was such that our allowable first transmit time was only 15 minutes before the start of the scheduled tests. Both stations were called but no replies heard. Our echoes peaked to 9 dB above noise during this test period. Sun noise was checked at 13 dB above sky noise.

"A further series of scheduled tests were carried out during the evening of 26/9 with European stations. OZ9CR was called but not heard. SK6AB was heard calling us and he was acknowledged, but another European station came on frequency during the last part of the test period and blotted him out.

"The last half hour of the test periods was scheduled as a 'CQ period' for VK2AMW. We were called by LX1DB in Luxembourg, who gave us 'O' reports (good signal strength). His signals peaked at 7 dB above noise and we were able to copy full calls without difficulty. Reports were acknowledged both ways for the first Australia-Luxembourg 70 cm contact.

"Noise 'signal' emanation from the stars at the Galactic centre was checked at better than 2.5 dB above cold sky noise. This information is now being evaluated to provide antenna gain — receiving system noise figure relationships which can be correlated with our noise measurements and cold — 50 ohm input termination resistor noise ation. (3.5 dB).

"VK2ZEN and VK2ALU carried out the September tests".

Also on the moonbounce scene this time we have some news from Chris VK5MC and his 144 MHz EME efforts thanks to the pages of "The Blurb". Chris writes:

"Over the past couple of months my windows for moonbounce have been troubled by the sun being in the same part of the sky as the moon. But they have now started to separate once more and signals are being heard.

"21/7/76 1738Z After repairing an isolating relay the night before, I found that no echoes were being received at the centre time. Quickly climbing the feed tower, and using a match to wedge closed the suspect relay so that I could receive, I tuned the band and immediately heard K8III. I took the chance of blowing up the pre-amp and called him, and was rewarded with an 'O' report and 349 RST. I later received a QSL card from him with a note from which I quote: 'My array of 32 yagis has been down due to ice since March, all I have now is 8 x 14 element KLM's . . . Man, what determination! Most people are lucky to have 32 elements let alone 32 yagis! 24/7/76 . . . heard WA7BJU and W2AZL having a contact — also heard K8III calling me, but no contacts resulted. 25/7/76 . . . worked a new one. K9HMB. Report sent 439, received 'O' report.

"A final note of interest. Have heard 3 dB of excess noise from the Milky Way, and this morning measured 17 dB of sun noise. More later."

Thanks Chris for the report, would like to hear of some of your later exploits.

**ODD ITEMS**

From time to time I receive requests from some writers for news of ATV activity. I will be glad to pass on such information through this column if it is sent to me, but it must be years since anyone has written to say what they are doing. Sorry you guys who are fretting for information, I cannot help you at the moment, but perhaps this plea will bring something of regular results.

Well, the summer DX season is with us now, and by the time you read these notes perhaps some exotic contacts have been made. While 6 metres seems to have a lot of glamour at this time, don't overlook the 2 metre band, lots of things can happen there. Peak time for long distance DX there seems to be towards Christmas so be on the lookout. Once the sporadic E type of 2 metre transmissions have disappeared, keep in mind the ducting and inversion type contacts particularly along the southern coastlines. It has been possible to work from VK3 and VK5 into Albany around January and February for several years now and 1977 may be the same.

As the Christmas season approaches may I take the space to wish everyone a very happy Christmas and a Prosperous New Year. I would like to thank everyone who has written to me during the past year giving me news and information for the column — it's pretty hard to keep it going sometimes, but I do the best I can. My thanks also to those various Clubs, and there are many, who continually forward me copies of their newsletters and publications, I use from them whatever I can which is of overall interest. Special thanks to Mac ZL3RK who keeps my subscription going to "Break In" in return for which I make sure he gets AR. Last but not least my thanks and best wishes to The Editor for his co-operation and tolerance of me, and the lack of complaints which seems to be the situation.

With all those special thoughts for the time of the year I would like to close with a special thought for the month: May all your troubles during the coming year be as shortlived as your New Year's Resolutions". And "Woman, examining diamond brooch, to jewellery salesman: 'I'm looking for a Christmas gift for a husband who got me an outboard motor last year".

73 The Voice in the Hills. ■

# IARU NEWS

Mr. Owen reported on return from his overseas journeys that the presentation shield he handed over to JARL on behalf of the WIA was very well received. Greetings to JARL on their 50th anniversary, from many amateur societies, were included in a well-produced booklet specially produced for the occasion.

**WARC 79**

The Federal President attended the 3rd meeting of the APG on 6th October and reported that discussions centred mainly on administrative matters. The next meeting scheduled for early in 1977 should deal with preliminary nitty-gritty details affecting the frequency spectrum in Australia.

During October the WIA voted in favour of the admission of the Radio Amateur Society of Thailand to the IARU Region 3 Association.

A letter was received from the Secretary/Treasurer of the PNG Amateur Radio Society advising that a Constitution for this Society has been agreed and recruiting for members was being undertaken. The writer was Gavin Wylie P29JW and he advised that John Baker P29WB was the President. This will be a most useful addition to amateur radio in Region 3 and deserves full support. The Society's address is P.O. Box 204, Port Moresby. ■

# IARU INTERNATIONAL WORKING GROUP MEETS IN GENEVA

The "International Working Group" convened by the President of the International Amateur Radio Union, Noel Eaton, VE3CJ, met in Geneva from the 17th to the 20th September, 1976.

Members of this Working Group included Roy Stevens, G2BVN, the Secretary of the IARU Region 1 Division Michael Owen, VK3KI, a Director of the IARU Region 3 Association and Vic Clark, W4KFC, the President of the International Amateur Radio Union Region 2 Division. Also present were "Tim" Hughes, G3GVV and David Sumner, K1ZND, the Assistant General Manager of the ARRL.

Two and a half days were devoted to the preparation of a model position paper to assist the smaller societies in appraising their governments of the legitimate requirements of the Amateur for frequencies through to the year 2000.

The International Working Group is making two significant recommendations to the Regional organisations. The first recommendation relates to the 40 metre band. It is the global position of the Amateur Service to seek expansion of that band. In Region 3 the band 7-7100 is presently allocated to the Amateur Service. At the conference in Hong Kong the Region 3 Association adopted a policy of seeking expansion of that band "upwards". Recognising the claims by the broadcasting service to frequencies on the high frequency side of the existing 40 metre band, the International Working Group has recommended a policy to seek expansion of the existing 40 metre band both above and below the existing allocation.

The other important recommendation made by the International Working Group relates to a preference for the frequency band 155-160 GHz instead of the previous recommendation of 165-170 GHz for the Amateur Service and Amateur Satellite Service. This change results from a recognition of the fact that the latter frequency band suffers from high absorption by water vapour and would be useless for terrestial communication purposes.

The Secretary of the Region 1 Division, Roy Stevens, undertook final editing of these papers which will be printed and circulated to the regional organisations. The Directors of the Region 3 Association will shortly be considering the adoption of these documents and then will attend to circulation of copies to the member societies of Region 3.

The members of the International Working Group also attended a reception held at the ITU and met delegates attending the Frequency Management Spectrum Seminar being conducted under the auspices of the International Frequency Registration Board, members of the International Amateur Radio Club and officials of the International Telecommunications Union. In addition, a meeting was held with the President of Deseau Des Emeteurs Francais (REF), Messieur M. J. Coussi, F9FF and other officers of REF.

**Michael S. Owen VK3KI.** ■

# 20 YEARS AGO

*Ron Fisher, VK3OM*

**DECEMBER 1956**

What were the aims of the Institute twenty years ago? The Editorial page of December 1956 Amateur Raido stated these aims which might be worth repeating.

To act as the voice of the Amateur in public discussions.

To assist in the investigation of communication problems.

To conduct educational work.

To provide a medium for exchange of ideas and to publish a journal.

To promote friendship between experimenters.

The Editorial then went on to suggest that we all should endeavour to encourage some young enthusiast. If this was important twenty years ago, it is even more important today. With so many young people turning to illegal operation on the 27 MHz band, we must make every effort to encourage them in the right direction.

Another Two-Metre Converter. Bob Winch VK2OA described his new design that produced a fantastic 5 dB noise figure when first turned on. The RF end used a 6AK5 EL91 cascade to a 6AK5 mixer.

Clamp tube modulation was popular in the fifties. Most people who used the famous type 3 mark 2 transceiver probably tried this system of modulation at one time or another. L. F. Brice VK5OK described two different ways of doing it.

The 1956 Remembrance Day results gave a win to Western Australia. Top scorers in each State were VK2AMR, VK3ATN, VK4CC, VK5EN, VK6FD, VK7AI and VK9DB.

Federal notes column advise that the VK1 prefix has been allocated to the Federal Capital Territory and that Antarctica, previously VK1 would become VK0. ■

# How many New Members have YOU introduced this MONTH?

# 1976 REMEMBRANCE DAY CONTEST RESULTS

| | a | b | c | d | e | f |
|---|---|---|---|---|---|---|
| VK5 & VK8 | 227 | 848 | 26.8 | 1579 | 65590 | 19137 |
| VK4 | 210 | 819 | 25.6 | 1829 | 57798 | 16649 |
| VK6 | 77 | 522 | 14.8 | 962 | 22663 | 4305 |
| VK7 & VK0 | 41 | 243 | 16.9 | 1093 | 13431 | 3359 |
| VK2 | 111 | 2226 | 5 | 1363 | 30054 | 2862 |
| VK3 | 97 | 2135 | 4.5 | 1092 | 31467 | 2522 |
| VK1 | 22 | 131 | 16.8 | 800 | 7866 | 2121 |

a—Logs received
b—Licences
c—% participation
d—Average top 6 logs
e—Total score
f—Trophy score

**DIVISIONAL SECTION LEADERS SCORES ARE SUBJECT TO FURTHER CHECKS**

In the following detailed scores the first figures are the points scores and the second are contacts made.

## VK1

### Phone

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ACA | 721 | 351 | MF | 297 | 149 | YR | 79 | 79 |
| VP | 705 | 302 | LF | 250 | 119 | ZMV | 66 | 66 |
| [illegible] | 624 | 325 | BH | 193 | 61 | ZPB | 45 | 45 |
| | 592 | 295 | GB | 177 | 82 | WI | 12 | 12 |
| [illegible] | 344 | 172 | ZAR | 132 | 132 | RY | 8 | 5 |
| ZT | 324 | 193 | ZJJ | 123 | 123 | PM | 7 | 7 |

### CW

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| VK | 418 | 79 | | | | | | |

### Open

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DC | 1073 | 462 | AOP | 1050 | 457 | DA | 626 | 302 |

## VK2

### Phone

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BYC | 1541 | 686 | BCW | 183 | 64 | ZSG | 51 | 51 |
| XT | 1147 | 407 | CH | 177 | 77 | AWX/2 | 50 | 50 |
| BDT | 915 | 339 | WT | 162 | 67 | CO | 48 | 48 |
| AGF | 911 | 310 | BZ | 158 | 64 | AIB | 44 | 29 |
| NW | 790 | 321 | CM | 150 | 67 | ZKQ | 44 | 44 |
| RW | 753 | 300 | AXU | 143 | 56 | ZVN | 40 | 40 |
| BDN | 690 | 298 | BRU | 137 | 50 | CF | 38 | 17 |
| AHV | 603 | 255 | CAF | 130 | 60 | LE | 36 | 20 |
| AJY | 603 | 266 | NF | 127 | 51 | BAD | 36 | 36 |
| ASY | 520 | 240 | BSG | 127 | 50 | IE | 29 | 29 |
| ADZ | 397 | 151 | AYL | 124 | 59 | ZUR | 29 | 29 |
| ALZ | 347 | 120 | PT | 123 | 34 | OH | 28 | 9 |
| RP | 343 | 169 | ASG | 122 | 37 | SR | 28 | 10 |
| AJH | 334 | 107 | HI | 106 | 35 | WD | 28 | 14 |
| | 324 | 141 | PN | 105 | 32 | NV | 24 | 24 |
| [illegible] | 321 | 133 | ASH | 105 | 31 | YEC | 23 | 23 |
| BMX | 306 | 120 | BTK | 102 | 34 | ZAX | 21 | 21 |
| PF | 302 | 102 | AUN | 101 | 42 | JF | 18 | 14 |
| BZJ | 264 | 114 | HO | 100 | 100 | AJQ/M | 18 | 18 |
| OW | 255 | 82 | MR | 100 | 46 | ZGK | 16 | 16 |
| BAX | 245 | 124 | UJ | 92 | 41 | AKH | 14 | 10 |
| AQ | 227 | 89 | ADL | 87 | 30 | ZID | 14 | 14 |
| FJ | 223 | 105 | RX | 84 | 54 | ZTM | 14 | 14 |
| ACK | 219 | 100 | BJN | 81 | 31 | YEG | 12 | 12 |
| DA | 210 | 150 | ZCT | 81 | 81 | BSC | 10 | 10 |
| AIM | 209 | 50 | HZ | 66 | 19 | AND | 7 | 7 |
| FM | 202 | 75 | EY | 64 | 25 | BQC | 7 | 7 |
| ABC | 193 | 56 | CS | 61 | 22 | SW | 6 | 6 |
| BFG | 187 | 95 | BJK | 57 | 34 | | | |

### CW

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| QL | 1342 | 223 | XQ | 614 | 116 | ADR | 208 | 48 |
| DT | 1134 | 204 | GT | 492 | 91 | IV | 184 | 33 |
| AFG | 848 | 149 | JY | 314 | 70 | JM | 158 | 35 |
| GR | 796 | 153 | VM | 314 | 56 | GW | 72 | 14 |
| BHO | 656 | 147 | NAG | 242 | 61 | RJ | 38 | 11 |

### Open

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CAX | 1642 | 520 | BYY | 227 | 156 | AAC | 109 | 56 |
| BO | 1370 | 417 | BLK | 197 | 103 | BCU | 71 | 32 |
| AOA | 600 | 268 | BCC | 179 | 49 | | | |
| HQ | 509 | 145 | GS | 169 | 71 | | | |

# CONTESTS

*Kevin Phillips, VK3AUQ*
**Box 67, East Melbourne, 3002**

## VK3

### Phone

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| HT | 1103 | 629 | BFN | 338 | 181 | YAF | 73 | 74 |
| AYF | 1032 | 559 | EF | 328 | 145 | AL | 68 | 21 |
| WP | 891 | 471 | XF | 322 | 158 | AJP | 67 | 23 |
| ADW | 888 | 424 | ZWM | 308 | 308 | ZDJ | 67 | 67 |
| BIZ | 848 | 449 | BA | 306 | 107 | BER | 63 | 34 |
| AMK | 792 | 388 | KK | 290 | 120 | YBE | 62 | 36 |
| AQZ | 765 | 413 | LV | 260 | 105 | ZNH | 60 | 60 |
| YO | 708 | 334 | RU | 233 | 85 | ZXD | 59 | 58 |
| CX | 705 | 413 | QZ | 231 | 110 | ZDN/P | 58 | 58 |
| SM | 698 | 333 | QG | 217 | 97 | NV | 52 | 31 |
| DF | 682 | 473 | AFU | 191 | 92 | OD | 52 | 43 |
| GX | 667 | 404 | PW | 169 | 61 | RF | 46 | 24 |
| ANM | 621 | 407 | WJ | 157 | 88 | OB | 41 | 20 |
| AKK | 545 | 211 | WM | 157 | 78 | KT | 40 | 42 |
| LP | 501 | 229 | AIE | 143 | 86 | WY | 35 | 20 |
| ZI | 501 | 318 | YIE | 136 | 136 | AFI | 34 | 31 |
| YQ | 432 | 179 | YH | 131 | 47 | ZVZ | 30 | 30 |
| AIZ | 430 | 196 | BFA | 113 | 62 | ARA | 25 | 9 |
| BBH | 416 | 207 | AHG | 105 | 51 | ALD | 23 | 7 |
| BHU | 394 | 222 | AXV | 101 | 63 | OL | 21 | 15 |
| ASN | 382 | 187 | HE | 97 | 31 | YHV | 19 | 19 |
| DS | 364 | 187 | AAJ | 97 | 45 | BCZ | 11 | 9 |
| BJH | 350 | 173 | ARS | 95 | 66 | ZLN | 11 | 11 |
| ZD | 344 | 155 | VQ | 75 | 30 | | | |

### CW

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| OP | 952 | 233 | XU/3 | 434 | 111 | IQ | 100 | 28 |
| CM | 734 | 187 | XB | 358 | 91 | KS | 38 | 10 |
| FC | 626 | 156 | JI | 312 | 62 | AZT | 36 | 11 |
| DG | 576 | 145 | UV | 150 | 37 | ACV | 34 | 9 |
| YK | 464 | 106 | BDH | 132 | 38 | | | |
| RJ | 460 | 111 | NK | 114 | 26 | | | |

### Open

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| UM | 1688 | 913 | QI | 358 | 136 | AMD | 258 | 84 |
| ALZ | 734 | 288 | AYL | 293 | 159 | VF | 253 | 105 |
| WW | 648 | 332 | PR | 292 | 111 | | | |
| YF | 483 | 149 | AUQ | 264 | 169 | | | |

## VK4

### Phone

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ZQ | 2184 | 981 | ZRF | 326 | 333 | SD | 117 | 31 |
| YS | 1893 | 663 | FN | 323 | 154 | ZNJ | 111 | 111 |
| VU | 1519 | 620 | FX | 321 | 102 | MA | 109 | 109 |
| VV | 1358 | 618 | U | 287 | 70 | BF | 108 | 40 |
| AM | 1274 | 517 | PJ | 286 | 117 | UM | 108 | 24 |
| LP | 1049 | 433 | ZBV | 255 | 255 | PU | 106 | 31 |
| DO | 1016 | 358 | NQ | 234 | 80 | 5AN/4 | 105 | 67 |
| RP | 964 | 288 | ZMG | 234 | 234 | ALM | 104 | 39 |
| MW | 929 | 311 | JG | 227 | 177 | ZGI | 103 | 104 |
| OW | 922 | 515 | CW | 221 | 102 | ZCL | 102 | 103 |
| ACM | 894 | 329 | LR | 218 | 150 | ZA | 100 | 100 |
| KW | 878 | 335 | QE | 215 | 103 | ZAE | 100 | 100 |
| TE | 842 | 400 | NIC | 209 | 83 | AL/4 | 98 | 35 |
| EQ | 839 | 374 | ZNI | 200 | 200 | SR | 98 | 62 |
| AAM | 717 | 342 | PS | 197 | 71 | HJ | 96 | 37 |
| AYM | 615 | 287 | GS | 185 | 86 | BG | 95 | 31 |
| ABJ | 577 | 238 | ZRQ | 185 | 185 | ARB | 94 | 37 |
| ADC | 532 | 298 | QC | 183 | 84 | AMO/4 | 92 | 31 |
| MM | 526 | 209 | XZ | 182 | 123 | EH | 91 | 81 |
| AAU | 484 | 150 | HB | 178 | 50 | YB | 90 | 30 |
| AAR | 470 | 221 | ZHW | 175 | 176 | 5HI/4 | 89 | 31 |
| LE | 443 | 153 | AEM | 162 | 50 | AAK | 87 | 32 |
| ZSH | 427 | 432 | CY | 159 | 57 | UD/4 | 85 | 28 |
| CZ | 405 | 131 | UJ/4 | 158 | 158 | ZDT | 85 | 85 |
| JP | 404 | 120 | ZDF | 155 | 160 | NEV | 84 | 36 |
| WIP | 399 | 241 | LW/P | 154 | 55 | CR | 78 | 31 |
| GI | 366 | 162 | ZBH | 151 | 149 | DY | 78 | 31 |
| AWR | 342 | 214 | KO | 148 | 61 | NP | 77 | 31 |
| QA | 340 | 137 | KD | 130 | 46 | RR | 70 | 30 |
| YT | 340 | 137 | LA | 120 | 75 | FK | 68 | 25 |
| QW | 65 | 30 | XV | 36 | 20 | ZJP | 19 | 19 |
| ZDS | 65 | 65 | ZMH | 36 | 36 | ZET | 18 | 18 |
| LB | 64 | 42 | 2AGA/4 | 35 | 14 | BQ | 17 | 5 |
| DH | 61 | 61 | AZ | 35 | 10 | EC | 17 | 8 |
| TO | 61 | 61 | ZDA | 34 | 34 | HD | 17 | 17 |
| JM | 60 | 61 | DV | 33 | 33 | NV | 17 | 5 |
| ZIT | 60 | 61 | UB | 32 | 10 | ABG/M | 17 | 17 |
| ZGB | 58 | 58 | LN | 31 | 17 | ZIS | 17 | 17 |
| ZZ | 56 | 17 | NF | 31 | 9 | PY | 15 | 7 |
| PV | 54 | 39 | ZDG | 31 | 31 | ZGJ | 14 | 14 |
| NBS | 51 | 36 | IF | 30 | 30 | ZLD | 14 | 14 |
| ZZE | 51 | 51 | ZFA | 30 | 30 | ZNZ | 14 | 14 |
| AQ | 49 | 23 | AAB | 28 | 15 | RG | 12 | 12 |
| FD | 49 | 49 | ZEA | 28 | 28 | GT | 9 | 9 |
| ZLL | 48 | 48 | BC | 27 | 27 | TN/M | 8 | 8 |
| EO | 44 | 30 | TL | 24 | 15 | XC | 7 | 7 |
| FE | 44 | 25 | ZKA | 22 | 22 | 2CZ/4 | 6 | 6 |
| GM | 43 | 43 | ZKL | 22 | 22 | DL | 6 | 6 |
| ZIG | 43 | 43 | MH | 21 | 21 | ZDK | 6 | 6 |
| HZ | 42 | 21 | TS | 20 | 20 | ZTV | 6 | 6 |
| MU | 42 | 17 | WIG | 20 | 18 | 3TG/4 | 5 | 5 |
| JJ | 41 | 42 | ZKP | 20 | 20 | 3ACN/4 | 5 | 5 |
| OR | 40 | 21 | EE | 19 | 10 | RJ | 5 | 5 |
| PD | 39 | 39 | FJ | 19 | 19 | ZS | 5 | 5 |
| PF | 37 | 17 | ACB | 19 | 19 | | | |

### CW

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| XA | 912 | 157 | XY | 404 | 72 | PB | 184 | 60 |
| KX | 796 | 132 | XJ | 362 | 70 | NJ | 86 | 19 |
| GH | 714 | 132 | ARL | 292 | 55 | WIB | 72 | 15 |
| FB | 628 | 100 | QM | 236 | 30 | SF | 70 | 16 |
| AXJ | 562 | 108 | AAF | 224 | 40 | IJ | 36 | 8 |
| LV | 414 | 70 | UA | 197 | 37 | | | |

### Open

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| HE | 2096 | 618 | WIT | 602 | 205 | ARC | 164 | 60 |
| RH | 1862 | 580 | LT | 534 | 156 | QF | 125 | 49 |
| MS | 1420 | 519 | SO | 507 | 139 | AML | 109 | 106 |
| YG | 1331 | 423 | QO | 481 | 201 | RO | 100 | 69 |
| UX | 1268 | 431 | RF | 382 | 168 | RZ | 86 | 33 |
| DT | 1201 | 453 | MY | 272 | 50 | FI | 80 | 23 |
| SE | 725 | 725 | NX | 244 | 100 | ABR | 70 | 40 |
| UC | 717 | 329 | CA | 192 | 55 | LZ | 60 | 19 |
| WL | 714 | 129 | NO | 187 | 31 | NRT | 17 | 10 |
| ZE | 693 | 409 | EZ | 180 | 51 | | | |

## VK5

### Phone

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| QX | 1794 | 796 | ZJH | 328 | 328 | TW | 168 | 61 |
| ZT | 1255 | 623 | XV | 325 | 109 | CA | 166 | 50 |
| KK | 1234 | 641 | CD | 314 | 107 | PO | 161 | 75 |
| LS | 1130 | 422 | ZG | 309 | 137 | OT | 158 | 50 |
| LP | 980 | 347 | XU | 306 | 105 | PV | 154 | 50 |
| GM/5 | 933 | 338 | CY | 297 | 90 | BP/5 | 153 | 63 |
| MM | 926 | 386 | ZE | 297 | 140 | DQ | 153 | 63 |
| NN | 917 | 360 | GO | 294 | 163 | ZK | 153 | 73 |
| GY | 914 | 365 | ZMH | 288 | 288 | FL | 151 | 40 |
| DV | 910 | 418 | RV | 285 | 107 | ZSD | 149 | 149 |
| NX | 894 | 319 | ZAC | 282 | 285 | SR | 146 | 45 |
| ZZ | 853 | 360 | ZWR | 271 | 271 | KG | 144 | 58 |
| TY | 728 | 332 | EJ | 263 | 100 | WU | 144 | 50 |
| LN | 709 | 287 | WF | 244 | 80 | ZSJ | 142 | 142 |
| BW | 704 | 274 | SS | 240 | 78 | LL | 140 | 60 |
| FD | 703 | 282 | GV | 234 | 86 | ZJA | 140 | 140 |
| BQ | 677 | 269 | NF | 234 | 87 | KH | 135 | 39 |
| KR | 644 | 367 | WR | 234 | 77 | UC | 133 | 36 |
| NJ | 633 | 220 | XI | 229 | 103 | ST | 131 | 62 |
| DI | 611 | 200 | QH | 221 | 122 | VN | 131 | 37 |
| QV | 602 | 220 | ZJV | 217 | 218 | OZ | 128 | 45 |
| ZB | 586 | 212 | SI | 215 | 85 | RI | 122 | 49 |
| ZVQ | 552 | 558 | WN | 212 | 106 | SV | 120 | 120 |
| JQ | 522 | 270 | ZJP | 208 | 208 | VB | 116 | 30 |
| ZJB | 510 | 505 | AWI | 206 | 114 | ZX | 116 | 42 |
| NC | 504 | 187 | WB | 205 | 115 | GU | 114 | 114 |
| ZAW | 476 | 476 | YR | 201 | 201 | ZDG | 113 | 113 |
| US | 455 | 150 | SE | 199 | 55 | ZTX | 113 | 113 |
| FZ | 451 | 433 | KX | 198 | 125 | OC | 108 | 30 |
| NA | 435 | 179 | SG | 196 | 62 | RQ | 106 | 30 |
| GL | 441 | 288 | EN | 194 | 61 | ZBC | 105 | 105 |
| FT | 418 | 149 | PN | 192 | 60 | PX | 104 | 43 |
| ZBI | 417 | 425 | ZLH | 192 | 192 | WV | 103 | 40 |
| ZSA | 410 | 410 | EF | 190 | 72 | ZIM | 103 | 103 |
| ND | 392 | 134 | HN | 190 | 101 | ZJE | 102 | 102 |
| ZAJ | 346 | 346 | AW | 181 | 83 | CW | 97 | 33 |
| AX | 343 | 120 | LC | 180 | 63 | LJ | 95 | 26 |
| ZU | 333 | 102 | CH | 170 | 63 | IQ | 92 | 33 |
| WI/5 | 330 | 111 | IB | 168 | 58 | ZGP | 91 | 91 |

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|---|---|---|---|---|---|---|---|---|
| ZHS | 86 | 86 | EB | 53 | 31 | ZNN | 30 | 30 |
| AL | 80 | 26 | ZRF | 50 | 50 | YW | 29 | 29 |
| WG | 80 | 30 | LX | 46 | 47 | ZPD | 29 | 29 |
| KW | 77 | 21 | WA | 43 | 14 | TU | 27 | 27 |
| CC | 75 | 30 | LG | 42 | 42 | ZPW | 27 | 27 |
| OS | 70 | 25 | GJ | 40 | 15 | GZ | 26 | 7 |
| RP | 68 | 29 | AD | 39 | 39 | MK | 24 | 24 |
| ZQ | 68 | 51 | ZR | 38 | 12 | FO | 18 | 6 |
| ZRA | 68 | 69 | UL | 34 | 10 | KS | 21 | 10 |
| BS | 67 | 18 | AM | 33 | 18 | AG | 17 | 11 |
| JX | 67 | 19 | 3AUG/5 | 32 | 32 | PI | 17 | 17 |
| CL | 66 | 41 | DF | 32 | 11 | ZFA | 15 | 15 |
| GX | 66 | 66 | KT | 32 | 22 | ZZX | 15 | 15 |
| JB/5 | 62 | 20 | PE | 32 | 15 | DO | 14 | 10 |
| HM | 62 | 15 | ZFJ | 32 | 32 | DH | 12 | 12 |
| EU | 61 | 58 | TF | 31 | 31 | ZIS | 11 | 11 |
| BG | 60 | 26 | ZBM | 31 | 31 | ZME | 11 | 11 |
| LZ | 56 | 46 | ZIB | 31 | 32 | CX | 10 | 10 |
| ZHV | 55 | 56 | SD | 30 | 17 | | | |
| ME | 54 | 30 | ZJJ | 30 | 30 | | | |

**CW**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MD | 1052 | 190 | DL | 354 | 65 | YY | 146 | 32 |
| SW | 952 | 170 | KI | 346 | 60 | DS | 104 | 15 |
| OR | 878 | 148 | LU | 280 | 55 | UE | 82 | 15 |
| LI | 868 | 151 | HR | 188 | 37 | GK | 60 | 9 |
| FM | 774 | 140 | ZF | 182 | 37 | KU | 58 | 10 |
| KL | 736 | 125 | AU | 160 | 28 | KY | 34 | 7 |
| QQ | 574 | 111 | QR | 146 | 30 | JG | 14 | 6 |

**Open**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO | 2261 | 679 | FH/5 | 463 | 132 | RK | 223 | 60 |
| [illegible] | 1474 | 588 | ZCF | 389 | 369 | LM | 216 | 91 |
| [illegible] | 1459 | 431 | QL | 380 | 356 | IP | 210 | 50 |
| [illegible] | 607 | 600 | QI | 357 | 100 | RR | 185 | 81 |
| RG | 532 | 139 | PK | 300 | 114 | ZS | 59 | 38 |
| RC | 506 | 129 | ZCR | 271 | 255 | JK | 57 | 40 |
| RX | 475 | 105 | LQ | 229 | 64 | TL | 35 | 16 |

## VK6

**Phone**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CB | 989 | 461 | AN/6 | 271 | 210 | ZAC/6 | 79 | 79 |
| OR | 977 | 405 | DY | 253 | 160 | SR | 77 | 31 |
| AO | 855 | 351 | PH | 243 | 108 | MM | 76 | 76 |
| QI | 794 | 323 | ZIH | 203 | 205 | MO | 74 | 34 |
| VW | 683 | 302 | DC | 196 | 76 | NC | 71 | 32 |
| JQ | 662 | 283 | SH/6 | 195 | 168 | TU | 70 | 26 |
| BD | 607 | 251 | ZGI | 193 | 192 | VE | 65 | 31 |
| QR | 556 | 231 | HU | 170 | 171 | NE | 63 | 59 |
| TR | 529 | 258 | TP/6 | 169 | 170 | WC | 63 | 63 |
| FP | 435 | 195 | ZDA | 149 | 150 | JK | 53 | 19 |
| II | 435 | 215 | SG | 147 | 55 | XD | 52 | 17 |
| ST | 425 | 165 | MB | 139 | 67 | WI | 47 | 47 |
| FW | 416 | 172 | BV | 138 | 59 | AWI | 47 | 47 |
| PD | 416 | 284 | ZLO | 137 | 137 | SI | 35 | 27 |
| WL | 413 | 175 | KC | 120 | 34 | WD | 21 | 15 |
| EB | 367 | 226 | EJ | 109 | 109 | CD | 20 | 11 |
| HA | 363 | 347 | LG | 109 | 90 | XW | 17 | 5 |
| KY | 351 | 277 | AV | 102 | 50 | JO | 10 | 10 |
| IW | 342 | 233 | DZ | 84 | 35 | ZDU/6 | 6 | 6 |
| DA | 336 | 133 | XY | 82 | 31 | | | |
| WT | 856 | 161 | MA | 366 | 76 | HG | 78 | 18 |
| AQ | 584 | 123 | VK | 298 | 61 | HD | 72 | 14 |
| HQ | 574 | 120 | SM | 176 | 21 | GA | 30 | 11 |
| RS | 476 | 101 | ZO | 116 | 24 | | | |

**Open**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RU | 1120 | 399 | HX | 390 | 92 | EG | 162 | 80 |
| ED | 973 | 318 | RV | 292 | 125 | | | |
| FI | 703 | 185 | HK | 291 | 129 | | | |

## VK7

**Phone**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| JV | 1504 | 618 | HK | 213 | 116 | ZKC | 61 | 61 |
| FT | 765 | 380 | TT | 169 | 87 | CF | 55 | 54 |
| KH | 685 | 299 | CL | 149 | 52 | BJ | 50 | 32 |
| MX | 518 | 256 | DK | 137 | 31 | AW | 48 | 31 |
| GW | 449 | 153 | JA | 116 | 31 | ZJG | 38 | 38 |
| SF | 346 | 144 | YL | 102 | 35 | AB | 32 | 13 |
| JU | 256 | 141 | PS | 79 | 71 | ZDF | 30 | 30 |
| SG | 233 | 85 | ZIE | 71 | 71 | JD | 20 | 12 |
| BM/7 | 215 | 100 | ZBL | 62 | 62 | PD | 10 | 10 |

**CW**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| OB | 916 | 198 | HE | 600 | 143 | JB | 246 | 58 |
| CH | 810 | 156 | GV | 298 | 59 | ZO | 48 | 19 |

**Open**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BC | 1288 | 428 | ZZ | 402 | 108 | AL | 237 | 70 |
| RH | 404 | 245 | RY | 276 | 90 | GB | 109 | 54 |

## VK8

**Phone**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CEG | 759 | 305 | CW | 468 | 200 | 4ZEZ/8 | 10 | 10 |
| DI | 744 | 277 | KP | 56 | 24 | ZTW | 9 | 10 |
| AS | 528 | 220 | ZCB | 16 | 16 | DA | 8 | 10 |

**CW**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| HA | 1002 | 183 | | | | | | |

## VK0

**Phone**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LD | 1276 | 218 | TB | 108 | 18 | | | |

## P29

**Phone**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DJ | 2935 | 753 | GQ | 586 | 150 | GA | 188 | 50 |
| DM | 952 | 245 | WB | 213 | 55 | | | |

**CW**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EJ | 580 | 92 | | | | | | |

## ZL

**Phone**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1BKX | 1858 | 498 | 2AUS | 1592 | 417 | 2HE | 284 | 73 |
| 1AGO | 1457 | 394 | 2KX | 954 | 247 | 3SZ | 1366 | 371 |
| 1BOL | 127 | 30 | 2GJ | 402 | 109 | 4MG | 622 | 166 |

**CW**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1BJH | 1000 | 133 | 4BE | 936 | 127 | | | |

**Open**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1GQ | 2040 | 350 | 1ACL | 1239 | 262 | 4IJ | 235 | 63 |
| 1AFE | 1395 | 266 | 3ABC | 491 | 123 | | | |

## CHECK LOGS

VK2ACO
VK2BBR
VK3BBS
VK5AI

## RECEIVING OPEN

| | | | |
|---|---|---|---|
| VK2 | R. Browne SWL2-BEQ | 257 | 105 |
| | S. Horon SWL2-BVS | 190 | 76 |
| | G. Bell SWL2-NGB | 68 | 34 |
| | P. Anslow SWL2-PMA | 55 | 21 |
| | R. Gosling SWL2-PMG | 53 | 22 |
| | A. Stollznow SWL2-SAR | 40 | 15 |
| | C. Maxworthy SWL2-MAX | 20 | 10 |
| | A. Brown SWL2-APB | 5 | 5 |
| VK3 | E. W. Trebilcock L30042 | 710 | 170 |
| | L. Cowcher | 653 | 254 |
| | P. Taylor | 403 | 180 |
| | M. Batt VK3/13062 | 161 | 74 |
| | M. Stephenson | Check log | |
| VK4 | G. C. Duckworth L40539 | 1105 | 463 |
| | J. L. Crawford | 1024 | 360 |
| | G. F. Featherstone L40392 | 689 | 261 |
| | C. H. Thorpe L40018 | 268 | 102 |
| VK5 | R. C. Witford | 1804 | 733 |
| | L. A. Collins L50805 | 1347 | 378 |
| | P. Dreimann | 603 | 209 |
| | R. G. Edmeades L50122 | 291 | 125 |
| | R. W. Parker | 279 | 97 |
| | J. Warrington | 239 | 239 |
| | A. D. Drexel | 211 | 95 |
| | R. Warrington | 150 | 150 |
| VK6 | F. H. Price | 448 | 193 |
| | J. R. Baxendale L60232 | 157 | 69 |
| VK8 | T. A. Hine | 2061 | 581 |
| ZL | Z. M. Pearce ZL2-129 | 842 | 154 |

## LOGS RECEIVED TOO LATE FOR INCLUSION IN THE RESULTS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| VK3APZ | 31 | 21 | VK5IU | 643 | 129 | VK7AX | 25 | 25 |
| VK4CU | 184 | 32 | VK6RL | 330 | 142 | | | |

## CONTEST CALENDAR

**December**

11/12 ARRL 10 Metre Contest
11/12 Hungarian CW Contest
11/12 Spanish CW Contest
11/Jan. 16 *ROSS HULL VHF MEMORIAL CONTEST
18/19 SOWP QSO Party

**January**

8/9 YU 80 Metre Contest
15 "Hunting Lions" Party
15/16 DL QRP Contest
28/30 CQ WW 160 Contest
29/30 French CW Contest

**February**

12/13 *JOHN MOYLE MEMORIAL NATIONAL FIELD DAY
26/27 French Phone Contest

*Indicates contest for Champions Trophy

## CONTEST CHAMPION TROPHY — Contests for 1977

1. 76/77 Ross Hull VHF Contest
2. John Moyle National Field Day
3. Remembrance Day Contest
4. VK/ZL/Oceania Phone
5. VK/ZL/Oceania CW

CQ WW DX Contest. This contest will be over by the time you read this issue, but I have some late news of a new trophy of interest to VK. The Trophy is for Oceania — Phone — Single Operator — 14 MHz. The John Martin VK3JW Memorial. (International Pacific DX Net donors).

### ARRL 10 Metre Contest

Starts 1200 GMT Dec. 11 and finishes 2359 GMT Dec. 12. The same station may be worked on both phone and CW. Send RS(T) and serial number starting at 001. US and Canadians will give RS(T) and their State or Province. Stations not land based will give their ITU region.

Each completed QSO counts 2 points or 4 points if it's a novice. Multiply by the number of US States, VE Call areas, DXCC countries and ITU regions worked (US and Canada not counted).

Frequencies — CW 28.000-28.050, Novice 28.100-28.150, SSB 28.500-28.600, AM 28.800-29.000. Oscar contacts permitted.

Mailing deadline for entries is Jan. 21st to: ARRL Communications Dept., 10 Metre Contest, 225 Main Street, Newington, Conn. 06111.

### Hungarian CW Contest

1600 Dec. 11 to 1600 Dec. 12. All bands 3.5 to 28 MHz may be used CW only. There are three classes: Single operator single band; single operator all band; and multi-operator all band. Exchange RST and a serial number starting at 001. In addition, HA stations will send 2 letters to identify their county.

Scoring — 1 point for each HA contact and each county counts as a multiplier on each band. Final score is the total QSO points times the sum of multipliers from each band.

HA countries: BA, BP, BE, BN, BO, CS, FE, GY, HA, HE, KO, NO, PE, SA, SO, SZ, TO, VA VE, ZA.

Send logs within 6 weeks to Radio Amateur League of Budapest, P.O. Box 2, H-1553 Budapest, Hungary.

### Spanish CW Contest

2000 GMT Dec. 11 to 2000 GMT Dec. 12. All bands 3.5 to 28 MHz, CW only. VK to work EA stations, each contact worth 2 points. Each EA call area worked on each band counts as a multiplier. Final score is sum of QSO points by the sum of the multiplier from each band. The same station may be worked on each band. Awards are gold, silver, and bronze medals for the first 3 place winners.

Logs must be postmarked no later than one month after the end of the contest. Include a summary sheet showing scoring and other pertinent information a signed declaration, and your name and address in block letters. Send logs to — U.R.E. Concurso International CW 1976, P.O. Box 220, Madrid, Spain.

### Ross Hull VHF Memorial Contest

It has been decided to include this contest for the 1977 Contest Champion Trophy as it is one of our national contests. The new rules for the contest were in last month's magazine, and hopefully will lead to a large number of logs being submitted. At the time of writing there have already been openings to JA, and interstate from VK3.

# KENWOOD COVERS THE WORLD

The Kenwood world of amateur radio equipment is one of quality and outstanding performance.
As an amateur you have the ability to evaluate communications equipment specifications and design features.
You may have heard other radio amateurs talking about Kenwood "Transmitted voice quality", "excellent receiver performance" and "well engineered and rugged construction".
From HF to VHF Kenwood technology is outstanding. We suggest that you ask your Kenwood dealer for all the facts before making your carefully considered decision.

TS-820*

SP-520

TS-520

TS-520

VFO-520

VFO-820

TR-2200

TR-7200

TS-700A

TV-502
TRANSVERTOR

* DUE TO UNPRECEDENTED DEMAND SOME DELAYS HAVE BEEN EXPERIENCED IN THE SUPPLY OF TS820 HF TRANSCEIVERS

Things look set for a good season, and with the large amount of off the shelf type equipment around now, activity should be fairly high. So join the contest, have a good time, meet all your old friends, make some new ones, and please submit a log. (It's much easier this year).

**John Moyle National Field Day**

This contest also counts towards the 1977 trophy. Rules will be in next month's AR. It will take place on the second weekend in February. You will have from now till then to check all the antennae, rigs, tents, put-puts, esky's, operators and etc. Make sure you have a site to go to, and be prepared to have a most enjoyable time.

See you all in the Ross Hull. ■

**COMMONWEALTH CONTEST 1976**

The following is extracted from the RSGB results of the 1976 contest:—

1. VE7CC 4188 points
2. VR1AA 3755 points
3. VK3MR 3377 points
4. VE3BMV 3345 points
5. VE7UZ 3322 points
6. ZL2BCO 3227 points

**Receiving Section**

1. Eric Trebilcock BCRS195 2145 points.

**Australian Scores**

| | | | | | |
|---|---|---|---|---|---|
| 3 | VK3MR | 3377 | 60 | VK3RJ | 790 |
| 8 | VK2BPN | 3028 | 62 | VK2XQ | 743 |
| 10 | VK5NO | 2937 | 63 | VK4UA | 738 |
| | VK4XA | 2535 | 65 | VK3XU | 705 |
| 20 | VK7BC | 2132 | 69 | VK4MY | 635 |
| 26 | VK3ZC | 1845 | 69 | VK8ZZ | 635 |
| 31 | VK3XB | 1701 | 72 | VK2NS | 619 |
| 35 | VK7CH | 1428 | 77 | VK2HC | 588 |
| 38 | VK5DL | 1319 | 81 | VK2YB | 535 |
| 40 | VK5KO | 1298 | 82 | VK2HW | 533 |
| 41 | VK7HE | 1248 | 86 | VK7RY | 477 |
| 42 | VK3CM | 1181 | 88 | VK5FM | 359 |
| 43 | VK7JB | 1174 | 91 | VK3CG | 311 |
| 44 | VK7OB | 1154 | 95 | VK5FG | 209 |
| 50 | VK3KS | 1029 | 96 | VK2GT | 176 |
| 58 | VK3YK | 823 | 98 | VK5HO | 150 |
| 59 | VK5KL | 810 | 99 | VK4XJ | 140 |

**Other Pacific area entrants**

| | | | | | |
|---|---|---|---|---|---|
| 6 | ZL2BCO | 3227 | 19 | ZL2BR | 2142 |
| 11 | ZL3GQ | 2725 | 29 | ZL1HV | 1800 |

and P29EJ 490 in 85th position.

"Snow" Campbell VK3MR therefore wins the silver medallion for the second year running, while the bronze medallion for the middle placing goes to Clarrie Castle VK5KL.

Scoring details, QSOs/Bonus per band, 80 to 10 metres are shown for VE7CC and VK3MR.

VE7CC 49/33 61/35 119/52 36/27 0/0
VK3MR 36/31 99/34 106/42 9/9 0/0

**RSGB Comments:**

The name may have changed, but the contest remains the same. This would appear to sum up the overwhelming sentiment among entrants this year. Although there was no repetition of the excellent conditions of 1975, we were glad to receive a healthy number of logs for this year's contest. A complete turnaround in results put the majority of top placings in the Pacific area, contrasting with last year when the honours went to Europe and North America.

Once again we were delighted to welcome the large number of entries from Australia but were rather disappointed to note the continued reduction in support for the listeners section. Can it be that this is a symptom of a decline in CW interest?

Top placing this year goes to Lee Sawkins, VE7CC, with D. Lockyer, VR1AA in second place. The latter result is somewhat amazing as Danny notes in his log that he did not hear or work a single G throughout the entire contest! He must also be one of the few high placings in recent years not to have used a beam.

The small entry in the receiving section in no way detracts from the win by Eric Trebilcock, BCRS195, of the Receiving Rose Bowl in his 35th year of participation.

The main point of comment in logs regarding the rules related to the duration of the contest. There is some feeling that we should revert to 48 hours with rest periods. This possibility was discussed by the committee last year and again this year and after much discussion it has been decided to leave things as they are for the 1977 contest. We feel that a 48-hour duration puts a great strain on VK/ZL entrants where the contest would extend well into Monday morning. Additionally, it is felt that this contest is one of the most demanding in the contests calendar, not only in terms of equipment but also in terms of propagation knowledge required and, most important of all, in the experience of the operator. These considerations are possibly what give this contest its unique appeal.

The other area of comment concerned CQ calls. The first few hours revealed the die-hards persisting with BERU and the more forward-looking with CC. We have it on good authority that the gentleman who sent CQ RU is not connected with any rugby organisation! However, within a short period everyone seemed to have standardised on CQ BERU and no doubt this will be the pattern for the future.

1977 contest is 12/13 March, same rules as before. ■

# QSP

**1977 SUBSCRIPTIONS**

Members will be receiving subscription renewal notices for 1977 at about the same time as this issue of AR arrives. Early payment greatly facilitates EDP data processing and will ensure that call book information will be correct. This is doubly important because of the separate identification of members and non-members (including unfinancials) in the 1977 call book. This work will begin during February/March when unfinancial members become liable to have their AR address labels suppressed as an automatic EDP function.

# AWARDS COLUMN

*Brian Austin, VK5CA*

**EU DIPLOMA (GERMANY)**

General

1. The award is available to licensed amateurs and shortwave listeners (on a "heard" basis).
2. The award is based on the calendar year. Only contacts in the current year and 4 preceding years are valid — see note below.
3. QSL cards must be submitted with the claim, which must be made in the special booklet, available from the sponsor's Awards Manager — see below — for 3 IRC.
4. There are no mode restrictions.
5. The fee for the award is 8 IRC which covers the return of QSL cards by registered mail.
6. The address for application is:
   Walter Geyrhalter DL3RK,
   Post Box 262,
   D-895 Kaufbeuren,
   Fed. Rep. of Germany.

Note: This is published in 1976 so the current year is 1976 and the 4 preceding years are 1972, 1973, 1974 and 1975.

**Rules:**

One contact per country per band is valid in any one year.

One point is scored for each valid contact in the current year (1976) and the preceding year (1975).

0.75 of a point is scored for each valid contact in the next preceding year (1974).

0.50 of a point is scored for each valid contact in the next preceding year (1973).

0.25 of a point is scored for each valid contact in the next preceding year (1972).

Totals are rounded to the nearest whole point.

New applications must be submitted to arrive BEFORE the end of June and BEFORE the end of December to be counted for the current year.

Additions to scores already submitted only require the additional QSL cards to be sent to the Awards Manager.

Requirements: A total of 100 valid points are required.

Country List: C31 CT1 CT2 DL/DM EA EA6 EI F FC G GC (Guernsey) GC (Jersey) GD GI GM GM (Shetland) GW HA HB9 HB0 HV I IS IT JW (Bear) JW JX LA LX LZ M1 OE OH OH0 OJ0 OK ON OY OZ PA SM SP SV SV (Crete) SV (Rhodes) TA1 TF UA1, 3, 4, 6 UA2 UB5 UC2 UO0 UN1 UP2 UQ2 UR2 UA (Franz Josef Land) YO Y ZA ZB2 3A 4U1 9H1.

**WORKED ALL ITALIAN PROVINCES**

General:

1. The award is available to licensed amateurs.
2. Contacts on and after 1/1/1949 are valid.
3. Members of an IARU Affiliated Society do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager of an IARU Affiliated Society. Non-members must send QSL cards to the sponsor.
4. There are no band or mode endorsements.
5. The fee for the award is $1 or 10 IRC.
6. The address for application is:
   ARI Servizio Diplomi,
   Via Scarlatti 31,
   20124 Milan,
   Italy.

**Requirements:**

Confirmed contacts with 60 different Provinces.

**List of Provinces:**

| | |
|---|---|
| Agrigento | Messina |
| Alessandria | Milano |
| Ancona | Modena |
| Aosta | Napoli |
| Arezzo | Novara |
| Ascoli Piceno | Nuoro |
| Asti | Padova |
| Avellino | Palermo |
| Bari | Parma |
| Belluno | Pavia |
| Benevento | Perugia |
| Bergamo | Pesaro |
| Bologna | Pescara |
| Bolzano | Piacenza |
| Brescia | Pisa |
| Brindisi | Pistoia |
| Cagliari | Pordenone |
| Caltanissetta | Potenza |
| Campobasso | Ragusa |
| Caserta | Ravenna |
| Catania | Reggio Calabria |
| Catanzaro | Reggio Emilia |
| Chieti | Rieti |
| Como | Roma |
| Cosenza | Rovigo |
| Cremona | Salerno |
| Cuneo | Sassari |
| Enna | Savona |
| Ferrara | Siena |
| Firenze | Siracusa |
| Foggia | Sondrio |
| Forli | Taranto |
| Frosinone | Teramo |
| Genova | Terni |
| Gorizia | Torino |
| Grosseto | Trapani |
| Imperia | Trento |
| L'Aquila | Treviso |
| La Spezia | Trieste |
| Latina | Udine |
| Lecce | Varese |
| Livorno | Venezia |
| Lucca | Vercelli |
| Macerata | Verona |
| Mantova | Vicenza |
| Massa | Viterbo |
| Matera | |

■

# LARA

*Ladies Amateur Radio Association*

This month, the LARA column comes from Anne VK7LY. Anne is one of the earliest members of LARA from outside VK3 and is a familiar and welcome face at conventions here in VK3.

"While a YL operator is disadvantaged to a certain extent by lack of strength and lack of height, when it comes to the 'rough' work, the hobby for the female carries with it certain advantages.

First of course comes the flattering looks, and sighs of admiration from other YL's accompanied by the remark 'Oh but of course I could never do that — I'm not brainy enough'. From the om's of course, the remarks are flattening rather than flattering (Just to 'keep them in their place').

The most obvious asset is ones never-ending tool kit and spare parts supply to be found not in

the ham-shack, but in the so called female domains of the house. And if by chance one essential piece of gear is mislaid just when it's needed, an equally good alternate can usually be found.

While a hair-curling wand may not quite double as a soldering iron (I haven't actually tried it yet, but it gets darned hot) it may serve to bend into shape that piece of ice-cream container you want for insulating purposes. Your coax has water in it? Just put it under the hair-dryer for an hour or so. The laundry has its use too — pegs and ice-cream sticks make excellent clamps, and those empty plastic containers used for soap liquid, bleach, etc., are excellent containers for weather-proofing traps for your dipole.

The rotary clothesline doubles as a 20 metre rhombic and curtain-rods can be commissioned if you are really hard up for elements for your beam.

Hunt through your hobbies cupboard (pre AR of course). I've just found about 1000 yards of plastic tubing from a project long since forgotten. Don't forget the sewing cupboard either — stitch-rippers are handy when working with coax, and needles of various sizes are handy for threading wire through awkward spots.

Some items must remain a YL secret lest the om's catch on and our precious storehouse is looted while we are away shopping. After all, it's bad enough when one of our precious knitting needles is filed down for a tuning tool, but I have it first-hand that a certain gentleman in Western Australia has taken to using cake-tins for chassis! Heaven help us YL operators if ever the om's ca on to what we do use to get that job done.

Just a final word for this year from LARA — the first whole year of LARA activity — to wish all members, associates, friends and neighbours on the bands, a Happy Christmas and New Year.

33's from LARA. ■

# LETTERS TO THE EDITOR

**Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.**

The Editor,
Dear Sir,

Some experimenters trying my noise cancelling circuit in AR, Oct. 76, may be having difficulty in obtaining an effective noise null. This is because there is no provision for adjustment of phase, except for that which can be obtained with the noise antenna tuner.

By inserting a switchable phase reversing transformer (ref. Orr's Radio Handbook pp. 25.13), a much improved null can be obtained.

Constructed the same as T2, and inserted between the main antenna and R2 with the pot si reversable so as to obtain either 0 or 180 degrees phase shift.

I would like to hear from experimenters using the circuit and learn of their travels.

Drew Diamond VK3XU. ■

The Editor,
Dear Sir,

Having been a member of the WIA since 1930 I feel that it is time that I voiced my complaints about the present way "AR" is produced and distributed.

This is brought about by the fact that the October issue only arrived yesterday (Friday 15th) and in the issue that I received there was no VK3 insert or information about the Eastern Zone Convention.

For many years "AR" was always in the member's hands within the first day or so of each month and on occasions was out before the beginning of the month.

With the present drive for new members it is time to get the magazine out at the beginning of the month again as it is very disheartening to wait day after day for the "Mag" to arrive.

Much has been said about the high cost of publishing "AR" and I cannot understand why it is necessary to have it printed on such expensive

# IONOSPHERIC PREDICTIONS

*Len Poynter, VK3ZGP*

**PREDICTIONS:**
Have recently been comparing the two basic prediction charts supplied by IPS, the MUF/ALF charts and the Graflex series as used to prepare the AR charts. Along with the current monthly preparations was a series of planning predictions based on various sunspot numbers.

The latter were quite comprehensive listing the spectrum from 3-40 MHz and it was surprising the detail shown that is not evident in the usual MUF/ALF series.

This was prompted by an article in the ITU Journal by Charles M. Rush, USAF Cambridge Research Laboratories on "Ionospheric observation networks for use in short term predictions". My own short exposure has led me to follow short term variations in the structure of the ionosphere. These variations lead to changes that differ significantly from the monthly averages for MUF/ALF.

Comparisons between the MUF/ALF curves and the Graflex system do allow for a closer watch being made on the possible departure from average, particularly during the period prior to, and subsequent to disturbances — that affect propagation.

The paper was interesting in that it proposed a global network of observatories, that could rapidly exchange information of local conditions that are reflected by solar flares, geomagnetic disturbances etc., so predictions could be rapidly made available to users.

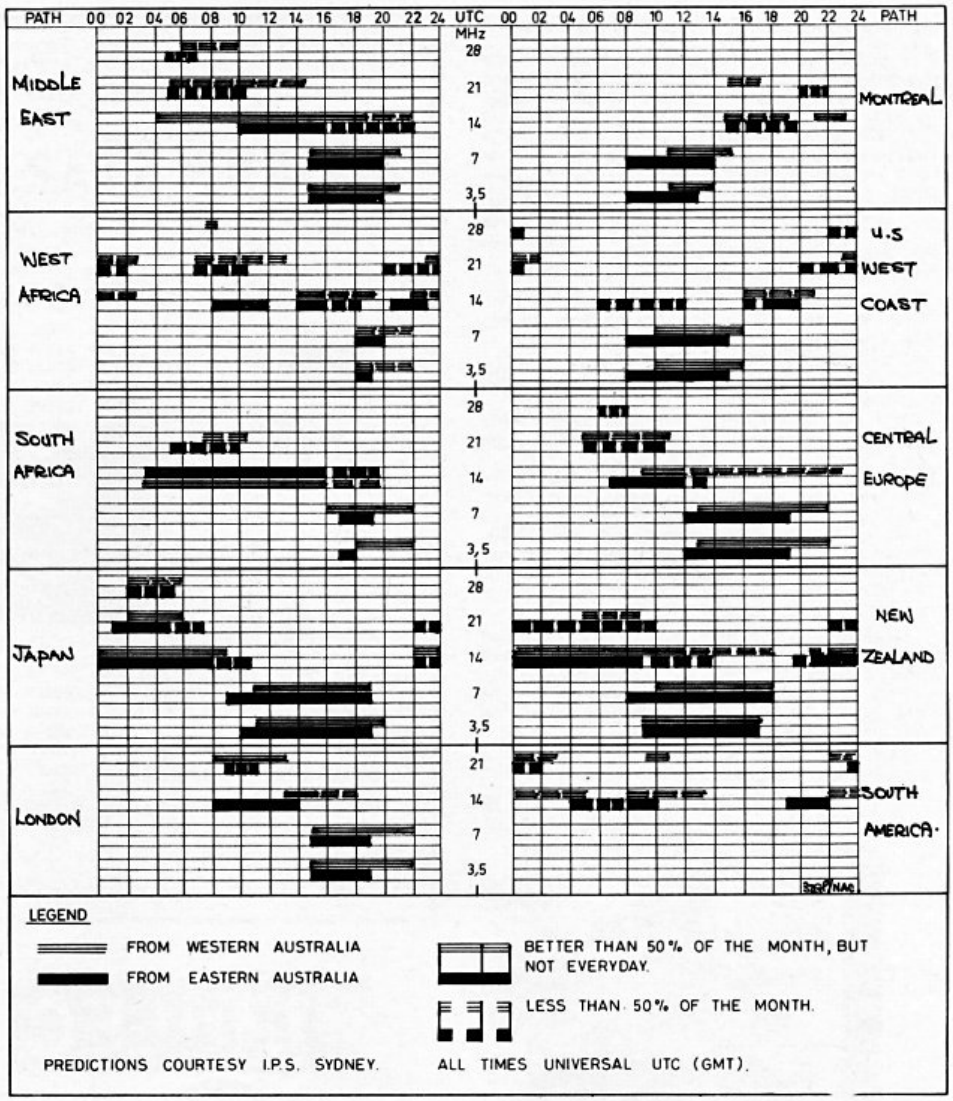
The proposition that short term observations provide a better indication of the ionospheric structure and electron content than do empherical formulae. The emphasis being placed on observing and predicting changes in the electron density region of the ionospheric, determining the characteristics of long haul HF circuits.

That so many use the MUF/ALF curves as gospel is unfortunate. Because they vary hourly, daily it is necessary to be able to observe and note just what is going on.

The predictions could well be described as a guide to when a particular path should be open when all the conditions used in preparing the prediction has been met. At this time in the Solar Cycle, an increase in solar activity will enhance conditions, where a large geomagnetic disturbance will degrade.

The provision of a world-wide ionospheric research network to put information into the hands of users without delay could revolutionise predicting and make it very similar to weather forecasting in general. The extremes that scientists went to in the manned lunar probes goes to show how their resources can be marshalled to provide service to users.

No doubt the costs will kill the proposal but there is no reason why amateur operators throughout the world could not form their own ionspheric alert network. Amateur communications have a wide diversity of systems and should be capable of forwarding information world-wide in a very short period. A network of stations with RTTY could push data and retain this data for use for local access almost round the clock. Interesting thought? "Dial-a-forecast" service for everyone!




What were your experiences during the recent eclipse? I trust you have made your own observations for your records. I would be interested to hear from you.

Well this is the end of another year and a very quiet year from an activity point of view. The smoothed running sunspot number continued to decline, though increasing numbers of Cycle 21 spots are now in evidence. It does look like the smoothed low of 5 will be reached early in the new year. If the activity increases by March then there is a strong possibility that activity will rise fairly quickly. The next possibility in lieu of March is the following August. In all 1977 should be worth watching.

The next maxima is expected to be a smoothed number of around 50 — or equivalent to the 1974 period and occur around 1984. Guess 10m will not be very active. Wonder what WARC will produce?

Wishing you all the best of DX in 1977.
73's VK3ZGP/NAC. ■

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paper. The NZART publication "Break In", "Electronics Aust." and many other periodicals use a good class of newsprint paper which must be cheaper than that at present being used for "AR" and consideration should be given to cutting costs by using a cheaper grade of paper.

If the placing of inserts in the magazine delays the posting of same, then it is time to cut the inserts out and have extra pages printed in the Mag. for the various State's notes as was done some years ago.

I realise that a lot of voluntary labor goes into the production of "AR" and while we appreciate the work that is being done, this is no excuse for the late arrival of the publication.

It is hoped that you will get the magazine out on time in the future even if it is necessary to change the printer or members of the committee (who are not pulling their weight) to do so.

"AR" means a lot to the country ham, in particular, and I trust that we can look forward to an improved service from now on.
W. R. Jardine VK3PR. ■

The Editor,
Dear Sir,
I was interested to read the article by P29EM/VK4AEM in the September AR. I feel however a few clarifications would be worthwhile. Although (obviously) not a frequenter of the HF bands, I have some knowledge of the events described as I was resident on Tahiti at the time the incident occurred.

Firstly, some pieces of geography.

The island where the accident occurred is known as Rapa, the real name of "Touboulawai" is Tubuai — both islands in the Australes group. Tubuai is about 24-30 hours steaming from Rapa and 2 hours flight time (Fokker F27) from Papeete. Whilst the "normal" steaming time from Rapa to Papeete (in a copra schooner — like the "Tuhaa Pae") is about 50-60 hours.

My heartiest congratulations to all the hams and others involved on this occasion. However there is a definite lack of enthusiasm by the local authorities in Tahiti to give much credence to any report delivered by 'Radio Amateurs'. The reason for this stems from the reluctance of visiting yachts equipped with amateur gear to apply for French licensing but continue to operate whilst anchored in port at Papeete — which to all intents and purposes is an illegal act (within the 3 mile limit). The other problem lies in the fact that a reasonable proportion of these same yachts do not have crew holding amateur licences but take advantage of the high seas to use a motley collection of Panamanian, US, Sth. American etc.

call signs that were never issued in their respective countries.

I feel the solution is identical to that proposed for our own VK CB 'Pirates' a little education and friendly helping hands. It is not difficult to obtain a call (ask the UNSWARS). If we give these people who are on the fringe of Amateur Radio we would do our hobby a great service and as well increase our usefulness in emergency situations.

Douglas C. Rosser VK2ZEX. ■

The Editor,
Dear Sir,

I am on a world-wide Dx trip, accompanied by my wife. We started 5 months ago in Germany and are visiting Dx stations on the way to try to activate rare call-signs.

I am writing monthly articles for the German "CQ-DL" magazine, which has a circulation of 30,000, describing amateur radio stations in various countries and interesting things about the life there.

So far we have travelled through the Middle East and Asia. We will be coming towards Australia in December '76/January '77. Our route takes us through Papua/New Guinea into Cairns. We would like to travel down to Brisbane, Sydney and Melbourne visiting ham stations along the way. We want to meet several hams and write articles with pictures about them.

Later our trip will take us to New Zealand and the Pacific Islands leading towards Hawaii and then to California, where my wife is from.

I am on the air quite often from rare Dx stations and talk a lot to VK-land. We can bring the QSL's along or send them direct.

Best 73s from Sabah in North Borneo at 9M6MU from Peter and Kathy.

Peter Jenus DJ8XW. ■

**DJ8XW, Peter and XYL Kathy at their station in Frankfurt, Germany.**

The Editor,
Dear Sir,

I have been asked to bring to your attention, a motion passed at the Moorabbin and District Radio Club's October General Meeting on Friday, 15th October, 1976. The motion reads:—

"That the Moorabbin and District Radio Club exhort the Wireless Institute to modify its attitude in respect of Citizens Band operation and henceforward make positive efforts to assist would-be-users in their attempts to secure wider and more legitimate operation in that service".

By way of explanation the following points are made:—

1. There appears to be no fundamental reason why any individual should be denied the use of a communications medium such as the so called Citizens Band, provided that there be compliance with any licensing, fee structure and technical requirements as may be reasonably imposed by the Regulatory Authorities. Difficulties in administration, the need to show reasonable cause, or the attitude that communication is a privilege cannot be considered valid grounds

for continued objection to the exercise of a fundamental right.

2. Rightly or wrongly the expressed viewpoint of the Institute (some facets of which were quoted out of context in the October 1976 issue of AR) has been taken as a contrary one by those seeking legitimate use of the Citizens Band. Recent television interviews with (currently illegal!) operators have made this quite clear.
3. It is the Moorabbin Club's opinion that ultimately the Institute's stance cannot remain substantially neutral as is now the case. Ultimately the Institute will have to come out either for or against the aspirations of would be Citizens Band users. In the event the Institute did not find in favour of Citizens Band users, it must be clear that the more cogent the "contrary" arguments put forward by the Institute the greater is the probability that these same arguments could be applied against the Institute and its members.
4. Current information indicates that (legitimate or not) there is already more CB equipment in Australia than amateur equipment. It follows there are already more CB operators than amateur operators. In terms of future Institute membership it seems more pragmatic to foster alliance with CB users than to oppose them or ignore their existence. In the event that the present demands in respect to Citizens Band are met, it is not unreasonable to assume that some form of Citizens Band Association will be formed. Such an association will, solely by virtue of the probable number of adherents, be at least equal in influence to the Institute so far as the general public and the Regulatory Authorities are concerned. It is not impossible that such influence could exceed that of the Institute.
5. It would be to the Institute's advantage to see a separate — and legitimate — means of lay communication established. Those wishing simply to have a communication facility could use authorised frequencies (instead of being tempted to "pirate" on amateur bands) whilst those wisihng to become technically competent in the design and manufacture of equipment for themselves could, perhaps, tend towards the amateur ranks. Would it be any sacrifice at all if the Australian Amateur Service freely gave up its 27 MHz allocation to CB users?
6. It is a fact of life, however unpalatable to regulating authorities and/or amateurs wishing to maintain the status quo, that mass communications is here and will stay. It would be fatal to the amateurs in general if they and their associations did not objectively recognise the traumatic changes of recent years. The belief that amateurs are still a privileged race has been outmoded by the very technology they espouse.

Toffler in his book "Future Shock" clearly describes the demise of people and organisations who refuse to acknowledge change or who refuse to accommodate change. Their sphere of influence and interaction becomes vanishingly small and may go to the grave as vegetables.

Let this not happen to the Institute.

Yours faithfully,
Harold L. Hepburn VK3AFQ
Committee member, Moorabbin and District Radio Club. ■

# PROJECT AUSTRALIS

*David Hull, VK3ZDH*

**AMSAT-OSCAR 6 and 7 ORBITAL DATA CALENDAR**

In co-operation with AMSAT, Skip Reymann, W6PAJ has published an improved AMSAT-OSCAR orbital data calendar containing all orbits for 1977 for both AMSAT-OSCAR 6 and AMSAT-OSCAR 7. Designed so that it may be hung on the wall, the calendar includes information on the operating schedules and frequencies for both spacecraft, and also the telemetry decoding equations. Also included is step-by-step information on how to determine times of passage of the two satellites.

The orbital calendar is available post-paid for $5.00 U.S. funds or 30 IRC's ($3.00 to AMSAT members, and free to AMSAT Life Members). Overseas orders will be air-mailed. Orders and payments should be made to:

Skip Reymann, W6PAJ
P.O. Box 374,

San Dimas, California 91773, U.S.A.

Please include a gummed, self-addressed label with your order to speed up processing.

Proceeds from the Orbital Calendar benefit AMSAT.

**OSCAR 6**
**JANUARY 1977**

| Date | Orbit No. | Time Z | Long °W |
|---|---|---|---|
| 1 | 19264 | 01.24 | 79.60 |
| 3 | 19289 | 01.18 | 78.35 |
| 2 | 19276 | 00.23 | 64.60 |
| 4 | 19301 | 00.18 | 63.35 |
| 5 | 19314 | 01.13 | 77.10 |
| 6 | 19326 | 00.13 | 62.10 |
| 7 | 19339 | 01.08 | 75.85 |
| 8 | 19351 | 00.08 | 60.85 |
| 9 | 19364 | 01.03 | 74.60 |
| 10 | 19376 | 00.03 | 59.64 |
| 11 | 19389 | 00.58 | 73.35 |
| 12 | 19402 | 01.53 | 87.10 |
| 13 | 19414 | 00.53 | 72.10 |
| 14 | 19427 | 01.48 | 85.85 |
| 15 | 19439 | 00.48 | 70.85 |
| 16 | 19452 | 01.42 | 84.60 |
| 17 | 19464 | 00.42 | 69.60 |
| 18 | 19477 | 01.37 | 83.35 |
| 19 | 19489 | 00.37 | 68.35 |
| 20 | 19502 | 01.32 | 82.10 |
| 21 | 19514 | 00.32 | 67.10 |
| 22 | 19527 | 01.27 | 80.85 |
| 23 | 19539 | 00.27 | 65.85 |
| 24 | 19552 | 01.22 | 79.60 |
| 25 | 19564 | 00.22 | 64.60 |
| 26 | 19577 | 01.17 | 78.35 |
| 27 | 19589 | 00.17 | 63.35 |
| 28 | 19602 | 01.12 | 77.10 |
| 29 | 19614 | 00.11 | 62.10 |
| 30 | 19627 | 01.06 | 75.85 |
| 31 | 19639 | 00.06 | 60.85 |

**OSCAR 7**
**JANUARY 1977**

| Date | Orbit No. | Time | Long °W |
|---|---|---|---|
| 1 | 9739 | 01.48 | 77.09 |
| 3 | 9764 | 01.42 | 75.59 |
| 2 | 9751 | 00.48 | 61.97 |
| 4 | 9776 | 00.41 | 60.47 |
| 5 | 9789 | 01.36 | 74.09 |
| 6 | 9801 | 00.35 | 58.97 |
| 7 | 9814 | 01.29 | 72.59 |
| 8 | 9826 | 00.28 | 57.47 |
| 9 | 9839 | 01.23 | 71.09 |
| 10 | 9851 | 00.22 | 55.97 |
| 11 | 9864 | 01.16 | 69.59 |
| 12 | 9876 | 00.16 | 54.47 |
| 13 | 9889 | 01.10 | 68.09 |
| 14 | 9901 | 00.09 | 52.97 |
| 15 | 9914 | 01.04 | 66.59 |
| 16 | 9926 | 00.03 | 51.47 |
| 17 | 9939 | 00.57 | 65.09 |
| 18 | 9952 | 01.51 | 78.71 |
| 19 | 9964 | 00.51 | 63.59 |
| 20 | 9977 | 01.45 | 77.21 |
| 21 | 9989 | 00.44 | 62.09 |
| 22 | 10002 | 01.39 | 75.71 |
| 23 | 10014 | 00.38 | 60.59 |
| 24 | 10027 | 01.32 | 74.21 |
| 25 | 10039 | 00.32 | 59.09 |
| 26 | 10052 | 01.26 | 72.71 |
| 27 | 10064 | 00.25 | 57.59 |
| 28 | 10077 | 01.19 | 71.21 |
| 29 | 10089 | 00.19 | 56.09 |
| 30 | 10102 | 01.13 | 69.71 |
| 31 | 10114 | 00.12 | 54.59 |

■

# WIA CONVENTION ROCKHAMPTON

**The Convention of the Central Queensland Division of the WIA held on the 28th and 29th of August was indeed a huge success.**

The guest of honour, Mr. David Wardlaw VK3ADW, the Federal President addressed a gathering of well over 100 and spoke of the necessity of amateurs and would be amateurs to fuliy support the WIA in its WARC work, of course never has an appeal been more urgent.

The repeater VK4RAR — R42 made its debut and Adrian Billard VK4MM gave a summary of its operation. Adrian was responsible for its electronics.

The smorgasbord was nothing less than a gourmet's delight.

The fox hunts saw very short lived foxes. Older "hams" of 60 years plus were seen racing like greyhounds through the undergrowth, such was their enthusiasm.

A 144 MHz signal was heard in Brisbane from Mount Archer the "local hill".

The prize winning antenna that accomplished this feat, a yagi with a 20 feet boom was seen heading towards Bilocla after the convention, in the charge of its new owner. He's coming back later for "the Hill".

The ladies had a lovely time discussing their complexion with a skin care specialist who displayed a colourful array of cosmetics. For a radio convention, this we understand is a unique idea with great merit.

My solid state after burner, an exhibit, now smells likes Ashes of Roses. Ah well!

Exhibits spanned a half century of progress. The equipment displayed ranged from a horn speaker of the early 1920s to colour TV cameras and monitors.

The convention was rounded off with a barbecue of succulent local steaks, salads and hot meals.

The committee, the organisers and the ladies must be elated at the compliments in praise of their efforts. Well done Rockhampton.

— VK5CGB/VK4 John W. Emmet PR Officer, Central Queensland Branch WIA. ■

## QSP

**IONOSPHERIC INDUCED INTERFERENCE**

FCC has been told "that by allowing AM 'clear channel' radio stations more power, other signals passing through the ionosphere could be harmed. These harmful effects could manifest themselves as interference, scattering and severe weakening of signals. Currently, 'clear channel' stations, those given an AM frequency between sunrise and sunset in order to eliminate interference, are restricted to 50 kW. In order to overcome the unsatisfactory night-time service suffered in some areas it had been proposed that the power output be lifted to 750 kW". The Telecommunications Journal Aug. '76 article carries on to say that a further field test is to be conducted.

# HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

**FOR SALE**

**Selling Whole Station** — includes Marconi CR150 receiver (2-60 MHz), home brew VHF AM transmitters 52 thru 576 MHz. Miscellany of converters, power supplies, valves, transistors, boards and random bits. What offers? VK3BAR QTHR. Ph. (03) 725-8702 A.H.

**Uniden 2020,** as new condition, $500. VK2BZ. Ph. (02) 546 2020.

**Fi101B Transceive.,** no mods, good condition, VK2BBJ. Ph. (02) 84 7170 A.H., (02) 631 7588 bus.

**FTDX 400** Transceiver, good condition, $325. VK2AAC, 20 Timaru St., Kirrawee 2232. Ph. (02) 521 7080.

**KW Viceroy** 10-80m SSB/AM/CW Tx and Hammarlund HQ170 Rx 160-2m, $230 ONO. VK2ATT, QTHR. Ph. (02) 476 2699.

**HT32A Hallicrafters,** Tx 240V AC PS, complete with mic. and instruction book very good order, $175, FL1000 Linear, EC instruction book, $230. VK2BDN, QTHR. Ph. (02) 747 5149.

**Acitron** 12 volt mobile type 3003 power supp y with circuit, wired for FT200 transceiver, all voltages for other transceivers, high, low, bias, etc. Can be changed for other sets. $75.00. VK5JX. Ph. (08) 43 4138, QTHR.

**HW-7 QRP** transceiver (going HW-8), numerous assorted HF transmitting valves (813, 807, 6146, 2E26, 6DQ5, 6DQ6B etc.) list supplied on request, 40-20-15 Quad (going X-Q quad), RG-8 coax approx 60 ft. VK5HP 17 Brodie Crescent, Christies Beach, S.A. 5165. Ph. 382 4159.

**Yaesu FT101** Transceiver 10-160 Mx, model prior to "B", mint condition, no mods, complete with P/T mike, leads manual, etc. $400. H. Crisp VK2LX, QTHR. Ph. (047) 92 2390.

**Yaesu SSB-CW Base or Mobile Equipment.** FT75 with 10 xtals, spare final tube, mobile cradle, manual. FV50C VFO (10 to 80m), FP75 AC PS incl. speaker, DC75 DC PS $285 the lot only. VK3UJ, QTHR. Ph. (03) 874 5632.

**Collins** 75S-3 Rx 10733 and 32S1 Tx with DX engineering processor model LC-1-325, complete with astatic 10D mic. and G stand; 516F-2 power supply and HD 250/110 V metal boxed with outlets transformer. Linear amp. SB200 Heathkit (250 volts). Beam TH3JNR 3 element and rotator. VK6NE, QTHR. Ph. (092) 46 3232.

**MR6A Xtls** for Ch. A, 40 repeater 2 repeater 4, very good condition. VK3ZYI, QTHR. Ph. (03) 82 7982.

**Yaesu-Musen FT200-FP200,** mint condition, complete unit including all 10m xtls, spare valves new valves fitted, no mods, bought for novice use, found it cannot be xtl locked, $330. Apply 23 Walden Street, Newstead, 7250. Ph. (003) 44 4172.

**FT200, FP200, FV200,** not 3 years old, mint cond., no mods., eng. man. orig. packing mic., $400. Gonets 520 AR7 rec. A, B, C, D boxes, VHF/HF conv. dual P/S rack, $50. AWA audio osc., AC 30 pre-set freq., ex-DCA, $10. TCA 1647 FM 2m base, Ch. 40 xtals, orig. man., $30. 6m carphone UIB P/S 12V U/xtals, $5. VK4CY, QTHR. Ph. (071) 43 1485.

**Rx AR8,** with handbook and speaker, less power supply, $15 or nearest offer. CRO, 5BPI, in working condition, 2 spare CRT's, circuits, $20 o.n.o. VK3BBK, QTHR. Ph. (03) 57 7894 A.H.

**Kenwood TR7200G.** VHF/FM transceiver, complete with all accessories and English instruction manual. Xtls for Ch. 8, Ch. 50 plus T/R 145.94 and 145.95. As new used for home station only, $185. Ross Treloar, VK2BPZ. Ph. (02) 239 5267 Bus.

**Collins KWM2 Transceiver,** 3 yrs. old, mint condition, $1100. FTDX400 ext. VFO and matching speaker, $400, excellent performer. FRDX400 Rx FM 2 and 6m, $325. FLDX Tx, $225. VK7AZ, QTHR. Ph. (002) 44 1165.

**Bendix LM7** frequency meter complete with AC power supply, $30. VK3TG, QTHR. Ph. (058) 52 1636.

**FTV-650 6m** transverter, used only once, ex. cond., complete all accses. in box, $130. MTR-13T 6m FM transceiver 52.525 MHz, $50. 6m 5 el. beam, folded, dipole D.El. ex. cond., $40. Dictaphones, good cond., P.S. units and mics., $10 each. Bruce Kendall VK3ZDM, 10 Carter Cr., Werribee, 3030. Ph. (03) 741 2382.

**Osker SWR** and power meter as new, $40. Kenwood Cardioid dynamic desk mike, new, $37. MFJ super logarithmic speech processor, unused model LSP 520 Bx 11, $50. RF Ammeter 0-5 amps, $6. Eric Bierre, VK2BEK, 8/66-68 Florence Street, Hornsby, N.S.W., 2077. Ph. (02) 476 5092.

**Realistic 'Patrolman 9'** RX, very good cond. with AM, SW, FM, VHF, UHF (450-470 MHz) and air. FM has been tuned to portion of lo-band, $80 (sells new $130). National IC-212 tape recorder, exc. cond., $40. IC-22 reps. 2-8, anti R2, 4, 8 50, simplex 37, 40, 43, 49, 50, 51, 53 61, 65, 70 V, $300. Europa-B 2 Mx transvertor for use with FT101, $150. Lionel, VK3NM, QTHR. Ph. (03) 88 3710.

**Heathkit Model HW-22A,** 200 W PEP sideband transceiver, with homebrew 12V DC power supply. Little used, best offer. VK2ABW, QTHR. Ph. (02) 88 1101.

**Ken KP202** 2m FM fitted with simplex channe's 40, 50, repeater channels 2, 4, 6, 8 with Nicad battery compact battery charger, KEN leather case, stubby helical antenna, manual, $140. VK3YBR. Ph. (03) 795 2792.

**Icom IC-22A** 2m transceiver, 7 channels, mobile mount, manual $170. Marc Jackson VK5ZHV, 219 Peachey Road, Smithfield Plains, S.A. 5114. Ph. (08) 87 3020 Bus. or (08) 254 7515 A.H.

**WANTED**

**Yaesu** FTV650B, FTV250B, FT101E. Bob. Ph. (02) 646 0426 Bus., (02) 46 3727 A.H.

**Your Reports** on propogation during the total eclipse. Forward to VK3AFW, QTHR.

# SILENT KEYS

**It is with deep regret that we record the passing of —**

| | |
|---|---|
| **Mrs. H. A. GROUSE** | **VK3AOK** |
| **Mr. A. J. MARTENS** | **VK5MA** |
| **Mr. C. J. OTHEN** | **VK5ON** |

**JOHN WINTON VK3XR**

**John was first licensed on 10 June, 1932, and was Secretary of the WIA in the early thirties. He was very active until the war years and was seriously wounded in June, 1945 at Bougainville.**
**It was not until the 50's that he became active again with projects, and during the 60's he began transmitting again.**
**John was plagued with illness since his retirement 4 years ago, but never lost his interest in electronics and amateur radio.**
**John Winton passed away on 4th June, 1976, aged 64, and we extend our deepest sympathies to his widow, Margaret, and family and friends.**

**Derived from information supplied by Cam VK5XR.**

**PETER LEMPRIERE VK3ALL**

**On Monday, 27th September whilst in transit to a club meeting at South Melbourne, Peter Lempriere VK3ALL suffered a heart attack and passed away.**
**Peter had been a licensed amateur for many years and was chiefly responsible for starting the Disabled Radio Amateurs Club — VK3ZZ.**
**The Club was constituted in May, 1973, and has met actively over the past 3 years, and holds field events and other activities.**
**The principle aim of the Club, as originally envisaged by Peter, is to foster interest in Amateur Radio amongst disabled and interested able bodied persons.**
**Equipment used at the club includes an FT200, IC21A, DV21.... TH3 Mark 3 beam and other gear.**
**This equipment has been purchased with the help of the Victorian Society for Crippled Children and Adults, mainly through the efforts and with the direction of Peter Lempriere.**
**He was the driving force behind the Club and will be sadly missed by everybody. All club members express their sincere sympathy to Peter's family.**

**Ian Westerland, President; Ted Egan, Past President, Disabled Radio Amateur's Club.**

**ERIC GORDON PUGH VK2ADK**

**Eric gained his licence on 15th March, 1936, and established his first amateur station at Coffs Harbour, N.S.W.**
**Later he moved and re-established his station at Lismore, Kempsey, Concord West and finally at 302 Morrisson Road, Ryde, where his towering beam has been a landmark for years.**
**Eric might well be regarded as one of the most widely known "Hams" in the world as he has been constantly involved in DX since 1936. In 1964 Eric and his XYL Alice visited U.S.A. and they met a number of DX friends in person.**
**Eric Pugh was a most dedicated "Ham" and he always built his own equipment to precision standards.**
**Eric spent 27½ years on the staff of 2GB at Sydney and had not long commenced to live in retirement when his unexpected sudden death occurred at his QTH on his 64th birthday, 11th October, 1976.**

**John VK2ADN**

**BILL LEWIS VK2YB**

**Because of his intense interest in the Wireless Institute, I feel more should be known regarding the late Bill Lewis, VK2YB, than just a mention in the list of "Silent Keys". Prior to obtaining his licence in 1926, he was an active member of the Croydon Radio Club which had the call of VK2YB and when that club handed in the call, Bill applied for it.**
**He joined the WIA in 1926 and was always a staunch supporter. He performed many functions for the VK2 Division, namely 2 years as President, a number of periods as a member of Council, a member of the Dural Committee, member of the Constitution Committee.**

**VK2YB was a regular call heard on field days during his amateur career and Bill felt it a "duty" in some respects to always take part in the John Moyle Memorial Field Day and had already made plans for the next one.**
**His interest was CW and only recently built a Heathkit HW101 transceiver, but rarely used the microphone.**
**Bill had other interests as well as amateur radio. He was a member of the RAAF and prior to World War Two operated as VK6YB whilst based at Pearce. Later he was to be commissioned as a radio officer. On Anzac Day he normally marched with 100 Squadron.**
**After World War Two he opened a radio and electrical business in Oxford Street, Paddington under his old call. In recent years he moved to Ryde and it was only just before his death he received his DXCC certificate.**
**His first heart attack occurred 10 years ago, and was to affect his life style from then on, but Bill would not give in.**
**From 1926 until his death, he was a member of the Western Suburbs Motorcycle Club and in his early days rode a Harley Davidson machine, christened "the wreck of the Hesperus".**

**Ten years ago he became a member of the well known and popular Sydney Male Choir and at the Chapel service, four members of the choir sang as a tribute to their late member.**
**For myself, I have lost a close friend of over 40 years in amateur radio. VK2QL**

**Tx or Txcvr** for all bands CW or CW/AM only; commercially made. VK5QQ, QTHR.

**RTTY Demodulator** wanted. G. Glendinning, 4 Hayes Lane, Mackay, Q'd. 4740.

**FT-401B Transceiver** with manual, must be good, details, including mods, if any, to VK2PT, QTHR. Ph. (049) 43 1308.

**Eddystone** general coverage receivers; Collins 32V3, Johnson Valiant or Drake 2NT transmitters. Price and condition details to David VK5HP, 17 Brodie Crescent, Christies Beach, S.A. 5165. Ph. 382 4159.

**Buy or photostat** manual for Lafayette TE-30 CR Analyser. Details to David VK5HP, 17 Brodie Cres., Christies Beach, S.A. 5165. Ph. 382 4159.

**Galaxy GT550** or Galaxy 5 Mark 3 with PSU, remote VFO, VOX and calibrator preferred. Good original condition essential. A. E. Cooling VK5ZE, 20 Blencowe St., Elizabeth South, S.A. 5112. Ph. (08) 255 2249 bus. hrs. or (08) 255 7586 A.H.

# JOIN THE REVOLUTION

## Get True Stereo with Sennheiser 'Open-Aire' Headphones

Sennheiser's revolutionary 'Open-Aire' headphone principle is the breakthrough audio engineers have waited for years.

Hundreds of thousands of satisfied users of earlier model Sennheiser 'Open-Aire' headphones have proved this new concept of near perfection sound experience.

And now the Sennheiser 'Open-Aire' stereo headphone Model HD 424 achieves listening perfection with incomparable brilliance.

The Sennheiser stereo headphone HD 424 is extremely lightweight and so comfortable, you hardly know you have it on.

R.H. Cunningham Pty. Ltd.

Technical Data:
Frequency response 16 . . . 20 000 Hz. Impedance 2 000 Ω. Weight 170 g. Cable length 3 m.

**VICTORIA:**
493-499 Victoria St.,
West Melbourne 3003
Phone: 329 9633

Telex 31447

**N.S.W.:**
4-8 Waters Rd.,
Neutral Bay 2089
Phone: 909 2388

Telex 21707

**W.A.:**
256 Stirling St.,
Perth 6000.
Phone: 28 3655

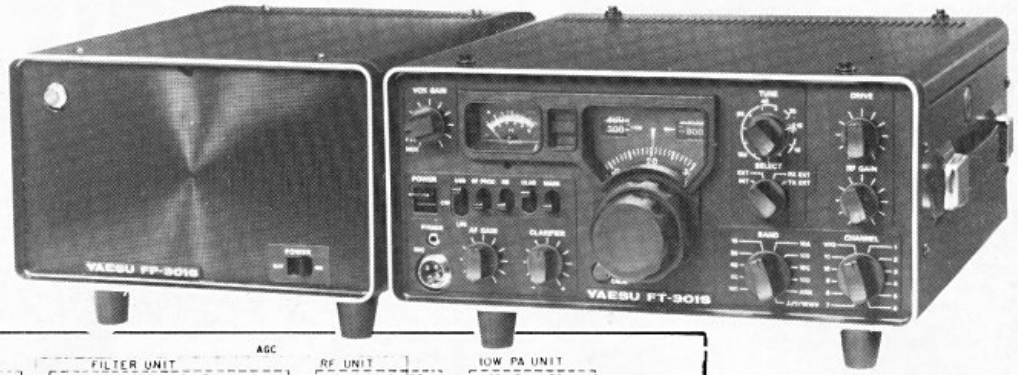
Telex 93244

**QUEENSLAND:**
L. E. Boughen & Co.
Cnr. Milton & Baroona
Roads, Milton 4064
Phone: 36 1277
Telex 41500

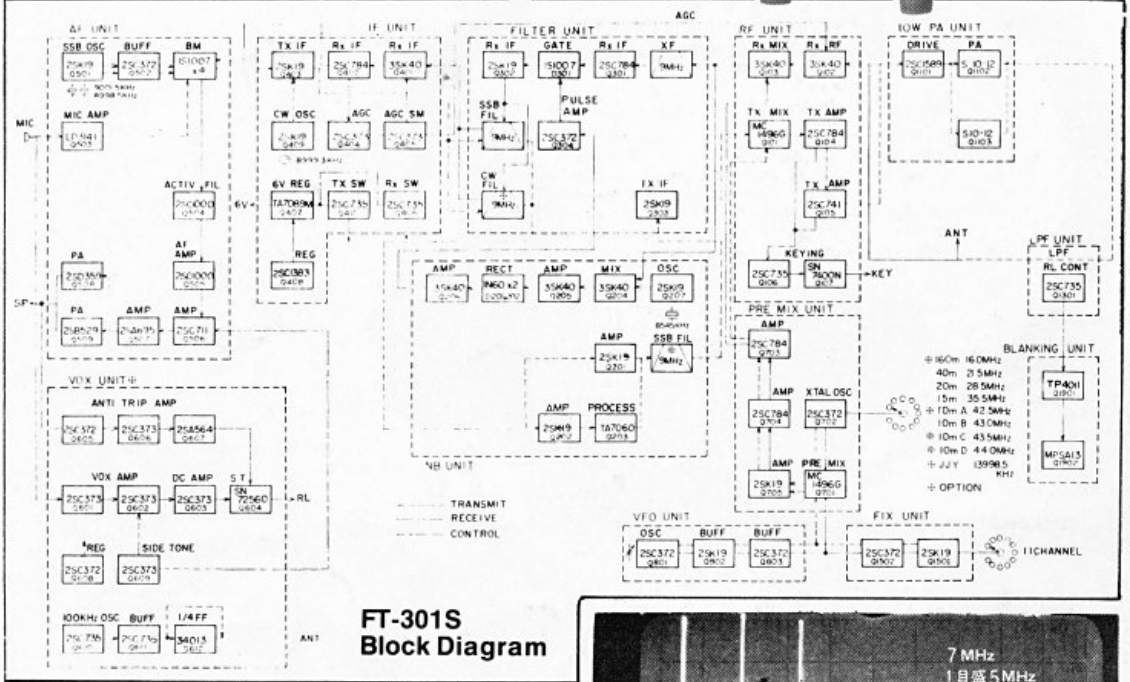
**SOUTH AUSTRALIA:**
Werner Electronic
Industries Pty. Limited,
Unit 25, 28 Gray St.,
Kilkenny 5009.
Phone: 268 2801

YAESU

## Latest addition to the YAESU line — FT-301S ALL SOLID STATE HF TRANSCEIVER

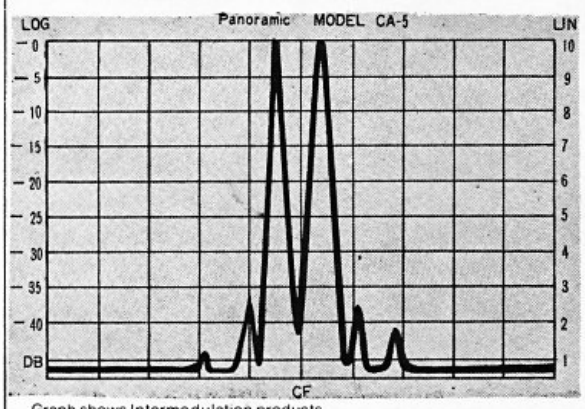



**The FT-301S is an advanced fully solid state H.F. SSB and CW transceiver covering 160 mx thru 10 mx, including one auxiliary band and WWV. It has all the outstanding features of Yaesu's top performance FT-101E (inc. built in RF Processor) plus many more additions (compact, solid state final, low power consumption).**

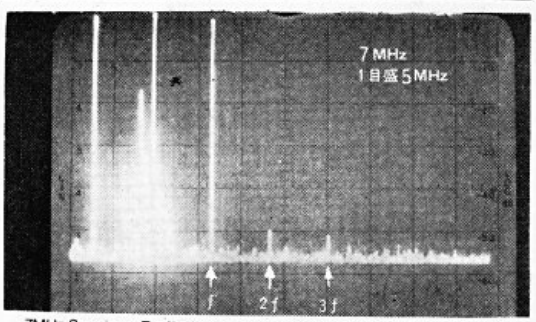



**FT-301S Block Diagram**

**Eleven crystal locked channels and 10 Watts PEP make the FT-301S particularly suitable for the new Novice and, at a later date, a 100 Watt outboard linear amplifier will be available from Yaesu, enabling the FT-301S to be uprated for full licence operation. Additional plus features include automatic high VSWR protection of the final amplifier output transistors and selectable 100 KHz and 25 KHz calibration. Special care is taken to reduce unwanted harmonic radiation by the inclusion of separate double section Low Pass Filters for each band. Stocks of the FT-301S are expected toward the end of September.**




Graph shows Intermodulation products




7MHz Spurious Radiation

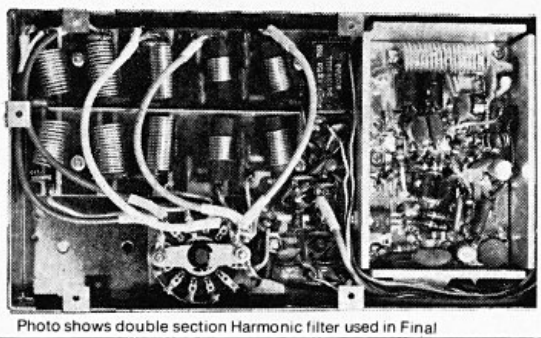


Photo shows double section Harmonic filter used in Final

## Technical Data

**Frequency Range**
160m 1.8-2.0 MHz.*
80m 3.5-4.0 MHz.
40m 7.0-7.5 MHz.
20m 14.0-14.5 MHz.
15m 21.0-21.5 MHz.
10m A 28.0-28.5 MHz.*
B 28.5-29.0 MHz.
C 29.0-29.5 MHz.*
D 29.5-30.0 MHz.*
WWV 5.0-5.5 MHz.*
Aux. 27.0-27.5 MHz.

**Mode**
LSB, USB, (A3J)
CW (A1)

**Input Power**
A1, A3J, 20 Watts DC

**Carrier Supp.**
Better than 40dB

**Adj. Sideband Supp.**
Better than 40dB

**Spurious Rad.**
Better than —40dB

**Audio Response**
300-2700 Hz. ±6dB

**Intermod. Distortion**
Better than —31dB

**Frequency Stability**
300 Hz or better within the first 30 minutes and less than 100 Hz after warmup

**Input Impedance**
50 Ohm

**Mic Impedance**
500 Ohm

**RX Sensitivity**
0.5μV for 10dB S/N

**Image Rejection**
Better than 50dB

**Selectivity**
SSB —6dB at 2.4 KHz
—60dB at 4.0 KHz
CW —6dB at 0.6 KHz *
—60dB at 1.2 KHz

**Crossmod**
Better than 60dB with a 20dB signal at the ant. terminal 20 KHz away

**Audio Output**
3W at 10% THD.

**Output Impedence**
4 Ohms.

**Supply Voltages**
DC 13.5V Receive 0.4 Amp
Transmit 3 Amp (at 10W)
AC 234V Receive 40 VA
(With FP-301) Transmit 110 VA (at 10W)

**Dimensions**
280mm wide, 125mm high, 290mm deep

**Weight**
7 kg.

*Options

Anticipated Prices
FT-301S Transceiver **$568**
FV-301 Matching VFO **$130**
FP-301 Heavy Duty AC Power Supply **$148**
(May also be used to power 100W final)

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